

NTS (.)
TYPICAL 1" ANGE CUT



SCALE 1:15
FOR DETAILS SCALE 1:7.5

APPROVED
4/24/06
Garnett M. ...
Dir. MD, AEGCL
Bruce Bryman
2000 Manager (11)

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2000 Manager (11)

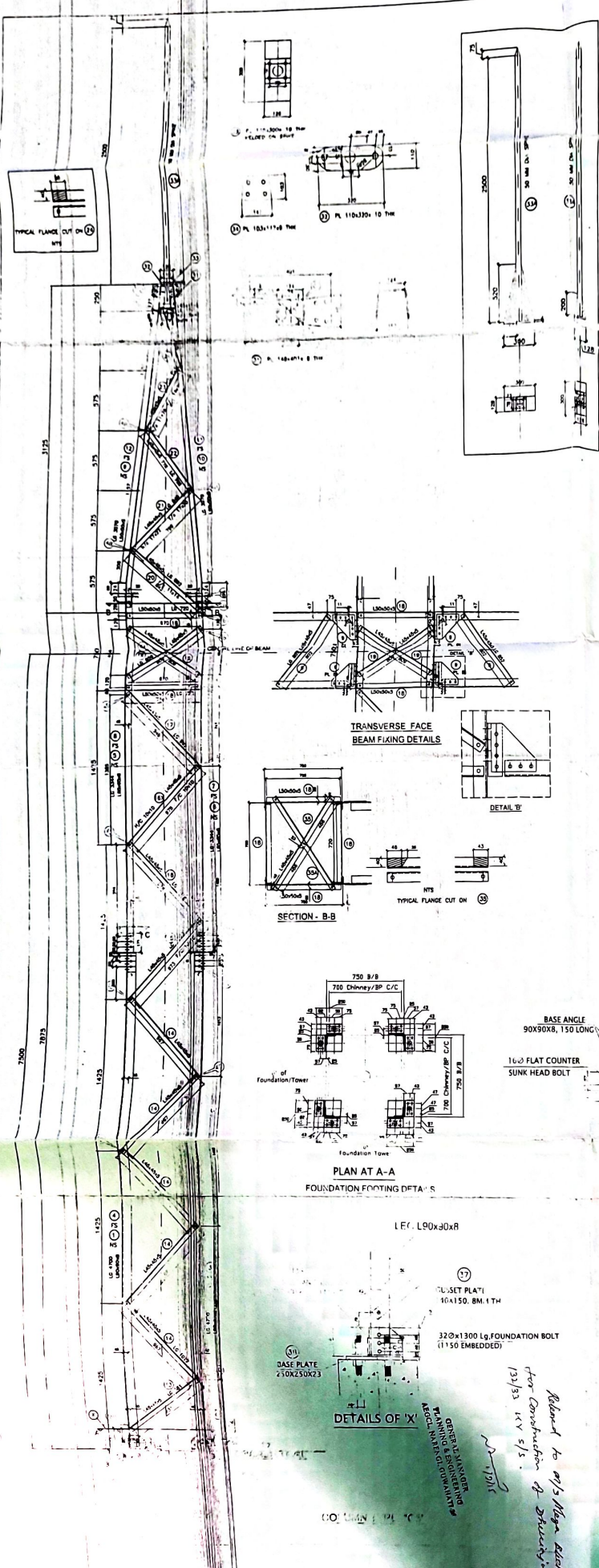
1. ALL ONE SIZES ARE IN MM
2. ALL HEADERS ARE OF MILD STEEL. IS 2062 (LATEST REV.)
3. FABRICATOR IN GENERAL, FOLLOWING IS BOLT/PART 1; SEC. 142 (LATEST REV.)
4. ALL STEEL ITEMS TO BE HOT DIP GALV. IS 2629 (LATEST REV.)
5. ALL BOLT & NUTS AS PER IS 6639 (LATEST REV.)
6. ALL BOLT & NUTS, SP. WASHED GALV. AS PER IS 5358 (LATEST REV.)
7. ALL HEADS UNLESS SPECIFIED ARE OF 17.5 MM FOR BOLT SIZE 16 MM
8. ALL ITEMS TO BE PREPARED WITH 15% BE
9. BACK MARK (GALV LINE) OF L54545 IS 23 MM
10. (9) INDICATES THE MARK FOR NUTS & BOLTS

TOTAL: 22.50 KG

FOR PLATES - UNIT WEIGHTS ARE IN KG/SQ.



GENERAL MANAGER
PLANNING & ENGINEERING
ALCOA, NARANGI, GUWAHATI 26



BILL OF MATERIALS		TOWER TYPE 'CS'		UNIT WEIGHTS ARE IN KG/CM ²		FOR PLATES - UNIT WEIGHTS ARE IN KG/CM ²	
NO.	ITEM	QTY	UNIT	REMARKS	NO.	ITEM	QTY
1	L80x10x10	4700	10.8	1	50.78	LEG	
2	L80x10x10	4700	10.8	1	50.78	LEG	
3	L80x10x10	4700	10.8	1	50.78	LEG	
4	L80x10x10	4700	10.8	1	50.78	LEG	
5	L80x10x10	3344	5.8	1	18.40	LEG	
6	L80x10x10	3344	5.8	1	18.40	LEG	
7	L80x10x10	3344	5.8	1	18.40	LEG	
8	L80x10x10	3344	5.8	1	18.40	LEG	
9	L80x10x10	3071	3.8	1	11.87	LEG	
10	L80x10x10	3071	3.8	1	11.87	LEG	
11	L80x10x10	3071	3.8	1	11.87	LEG	
12	L80x10x10	3071	3.8	1	11.87	LEG	
13	L45x45x5	881	3.4	4	11.88	BRACING	
14	L45x45x5	1017	3.4	20	88.18	BRACING	
15	L45x45x5	1022	3.4	4	13.91	BRACING	
16	L45x45x5	1022	3.4	4	13.98	BRACING	
17	L45x45x5	999	3.4	4	13.58	BRACING	
18	L80x10x10	720	3.1	8	21.89	BELT	
19	L45x45x5	877	2.4	4	11.68	Y-TYPE BRACING	
20	L45x45x5	833	3.4	4	11.33	Y-TYPE BRACING	
21	L45x45x5	892	3.4	4	12.13	BRACING	
22	L45x45x5	848	3.4	4	11.54	BRACING	
23	L45x45x5	768	3.4	4	10.44	BRACING	
24	L45x45x5	701	3.4	4	8.53	BRACING	
25	L45x45x5	853	3.4	4	8.88	BRACING	
26	L45x45x5	188	3.4	4	2.28	BELT	
27	8 THK	50x356	47.1	8	6.71	JOINT PL	
28	2 THK	50x175	15.7	8	1.85	PACK PL	
29	L80x10x10	358	4.5	4	1.1	JOINT ANGLE	
30	8 THK	148x401	47.1	1	2.78	CAP PLATE	
31	10 THK	110x320	78.5	1	2.78	TENSION PLATE	
32	18 THK	128x300	125.9	1	1.82	FLAT PLATE FOR	
33	8 THK	103x147	47.1	2	1.43	CAP SIDE	
34	L45x45x5	1022	3.4	2	8.95	PLATE BRACING	
35	L45x45x5	1022	3.4	2	8.95	PLATE BRACING	
36	L80x10x10	150	10.8	8	12.88	BASE ANGLE	
37	8 THK	140x150	82.8	8	10.55	BASE SIDE PLATE	
38	25 THK	250x250	180.55	4	45.14	BASE PLATE	
TOTAL = 867.40 KG							

FOR PLATES - UNIT WEIGHTS ARE IN KG/CM²

35A 50MM DIA 2500 1 SPIKE

NOTE:

- ALL DIMENSIONS ARE IN MM.
- FABRICATION IN GENERAL FOLLOWING IS B22(PART 1, SEC 1.8.2 (LATEST REV.)
- ALL STILL ITEMS TO BE HOT DIP GALV. IS 2829 (LATEST REV.)
- ALL BOLT & NUTS AS PER IS 6839 (LATEST REV.)
- ALL BOLT & NUTS, SP. WASHER GALV. AS PER IS 5358 (LATEST REV.)
- ALL ITEMS TO BE PREPARED WITH 'CS'
- BE - MARK (GAUGE LINE) OF L45x45x5 IS 23 MM
- INDICATES THE MARK FOR NUTS & BOLTS

SCALE 1:20
FOR DETAILS SCALE 1:10

Checked & Found to Order
By: [Signature]
Date: [Date]

General Manager (Ch)
Chd. M.D., AEGL
Bharat Heavy Electricals Ltd.
Bhilai, Rourkela, Cuttack

APPROVED
[Signature]
General Manager (Ch)
Chd. M.D., AEGL
Bharat Heavy Electricals Ltd.
Bhilai, Rourkela, Cuttack

BILL OF MATERIALS
FOR NUTS & BOLTS OF TOWER TYPE 'CS'

MARK NO.	BOLT SIZE	QUANTITY	W/BOLT	TOTAL WT	EXTRA	TOTAL WT	REMARKS
			KG (A)	KG (B)	KG (A+B)		
A	M 18x25	14	0.117	1.64	0.16	1.80	
B	M 18x40	108	0.125	7.00	0.70	7.70	
C	M 18x45	118	0.133	15.43	1.54	16.97	
D	M 18x50	16	0.141	1.13	0.11	1.24	
E	M 18x55	4	0.148	0.59	0.00	0.59	
F	M 18x60	4	0.157	0.63	0.00	0.63	
TOTAL							28.24 KG

FOR BASE PLATE:

MARK NO.	NO.	SIZE	QUANTITY	W/BOLT	TOTAL WT	EXTRA	TOTAL WT	REMARKS
				KG (A)	KG (B)	KG (A+B)		
1	18x40	22	0.125	2.75	0.00	2.75		SUNK IN
2	32x1300	8	0.21	1.68	0.00	1.68		FOUNDATION
TOTAL							4.43 KG	

M/S NECCON POWER & INFRA LTD.
A.T. ROAD JODHPUR ASSAM

PROJECT: TURNKEY CONSTRUCTION OF 332/33 KV JARAI SUBSTATION

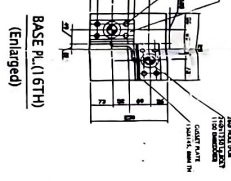
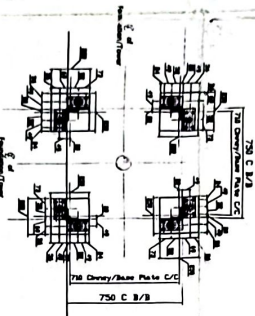
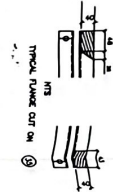
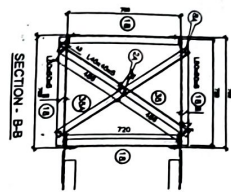
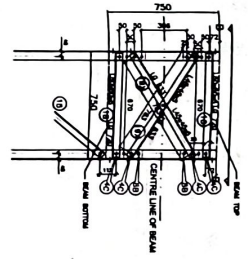
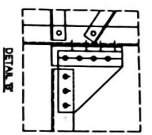
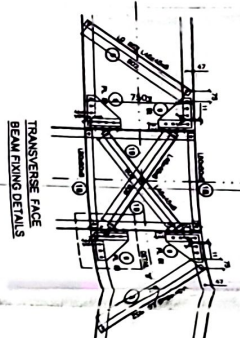
DATE: 13/03/2018

FOR DETAILS SCALE 1:10

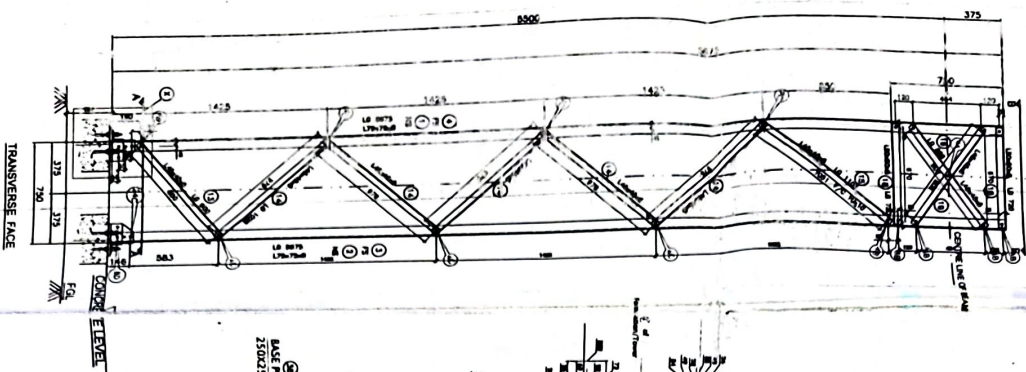
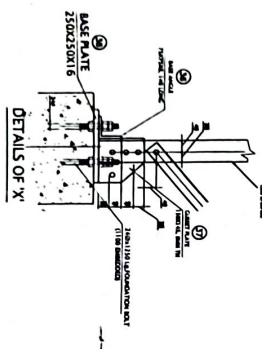
Checked by: [Signature]
Date: [Date]

General Manager (Ch)
Chd. M.D., AEGL
Bharat Heavy Electricals Ltd.
Bhilai, Rourkela, Cuttack

Refer to only after clearance
for construction of structure
13/03/2018



FOUNDATION FOOTING DETAILS



COLUMN TYPE 'C'

TABLE OF MATERIALS FOR DETAILS OF TOWER TYPE 'C'

MARK	BAR SIZE	QUANTITY	W/BOLT	TOTAL WT.	EXTRA WT.	TOTAL WT. REMAINS
A	M 18/20	14	0.117	1.64	0.18	1.46
B	M 18/20	34	0.138	4.70	0.70	4.00
C	M 18/20	84	0.133	11.17	0.80	10.37
D	M 18/20	8	0.141	1.13	0.11	1.02
E	M 18/20	0	0.149	0	0	0
TOTAL				28.61		27.55

TABLE OF MATERIALS FOR DETAILS OF TOWER TYPE 'C'

MARK	SECTION	LENGTH	WT.	TOTAL WT.
1	1.1/2" DIA. STEEL	50.00	8.8	440.0
2	1.1/2" DIA. STEEL	50.00	8.8	440.0
3	1.1/2" DIA. STEEL	50.00	8.8	440.0
4	1.1/2" DIA. STEEL	50.00	8.8	440.0
5	1.1/2" DIA. STEEL	50.00	8.8	440.0
6	1.1/2" DIA. STEEL	50.00	8.8	440.0
7	1.1/2" DIA. STEEL	50.00	8.8	440.0
8	1.1/2" DIA. STEEL	50.00	8.8	440.0
9	1.1/2" DIA. STEEL	50.00	8.8	440.0
10	1.1/2" DIA. STEEL	50.00	8.8	440.0
11	1.1/2" DIA. STEEL	50.00	8.8	440.0
12	1.1/2" DIA. STEEL	50.00	8.8	440.0
13	1.1/2" DIA. STEEL	50.00	8.8	440.0
14	1.1/2" DIA. STEEL	50.00	8.8	440.0
15	1.1/2" DIA. STEEL	50.00	8.8	440.0
16	1.1/2" DIA. STEEL	50.00	8.8	440.0
17	1.1/2" DIA. STEEL	50.00	8.8	440.0
18	1.1/2" DIA. STEEL	50.00	8.8	440.0
19	1.1/2" DIA. STEEL	50.00	8.8	440.0
20	1.1/2" DIA. STEEL	50.00	8.8	440.0
21	1.1/2" DIA. STEEL	50.00	8.8	440.0
22	1.1/2" DIA. STEEL	50.00	8.8	440.0
23	1.1/2" DIA. STEEL	50.00	8.8	440.0
24	1.1/2" DIA. STEEL	50.00	8.8	440.0
25	1.1/2" DIA. STEEL	50.00	8.8	440.0
26	1.1/2" DIA. STEEL	50.00	8.8	440.0
27	1.1/2" DIA. STEEL	50.00	8.8	440.0
28	1.1/2" DIA. STEEL	50.00	8.8	440.0
29	1.1/2" DIA. STEEL	50.00	8.8	440.0
30	1.1/2" DIA. STEEL	50.00	8.8	440.0
31	1.1/2" DIA. STEEL	50.00	8.8	440.0
32	1.1/2" DIA. STEEL	50.00	8.8	440.0
33	1.1/2" DIA. STEEL	50.00	8.8	440.0
34	1.1/2" DIA. STEEL	50.00	8.8	440.0
35	1.1/2" DIA. STEEL	50.00	8.8	440.0
36	1.1/2" DIA. STEEL	50.00	8.8	440.0
37	1.1/2" DIA. STEEL	50.00	8.8	440.0
38	1.1/2" DIA. STEEL	50.00	8.8	440.0
39	1.1/2" DIA. STEEL	50.00	8.8	440.0
40	1.1/2" DIA. STEEL	50.00	8.8	440.0
41	1.1/2" DIA. STEEL	50.00	8.8	440.0
42	1.1/2" DIA. STEEL	50.00	8.8	440.0
43	1.1/2" DIA. STEEL	50.00	8.8	440.0
44	1.1/2" DIA. STEEL	50.00	8.8	440.0
45	1.1/2" DIA. STEEL	50.00	8.8	440.0
46	1.1/2" DIA. STEEL	50.00	8.8	440.0
47	1.1/2" DIA. STEEL	50.00	8.8	440.0
48	1.1/2" DIA. STEEL	50.00	8.8	440.0
49	1.1/2" DIA. STEEL	50.00	8.8	440.0
50	1.1/2" DIA. STEEL	50.00	8.8	440.0
51	1.1/2" DIA. STEEL	50.00	8.8	440.0
52	1.1/2" DIA. STEEL	50.00	8.8	440.0
53	1.1/2" DIA. STEEL	50.00	8.8	440.0
54	1.1/2" DIA. STEEL	50.00	8.8	440.0
55	1.1/2" DIA. STEEL	50.00	8.8	440.0
56	1.1/2" DIA. STEEL	50.00	8.8	440.0
57	1.1/2" DIA. STEEL	50.00	8.8	440.0
58	1.1/2" DIA. STEEL	50.00	8.8	440.0
59	1.1/2" DIA. STEEL	50.00	8.8	440.0
60	1.1/2" DIA. STEEL	50.00	8.8	440.0
61	1.1/2" DIA. STEEL	50.00	8.8	440.0
62	1.1/2" DIA. STEEL	50.00	8.8	440.0
63	1.1/2" DIA. STEEL	50.00	8.8	440.0
64	1.1/2" DIA. STEEL	50.00	8.8	440.0
65	1.1/2" DIA. STEEL	50.00	8.8	440.0
66	1.1/2" DIA. STEEL	50.00	8.8	440.0
67	1.1/2" DIA. STEEL	50.00	8.8	440.0
68	1.1/2" DIA. STEEL	50.00	8.8	440.0
69	1.1/2" DIA. STEEL	50.00	8.8	440.0
70	1.1/2" DIA. STEEL	50.00	8.8	440.0
71	1.1/2" DIA. STEEL	50.00	8.8	440.0
72	1.1/2" DIA. STEEL	50.00	8.8	440.0
73	1.1/2" DIA. STEEL	50.00	8.8	440.0
74	1.1/2" DIA. STEEL	50.00	8.8	440.0
75	1.1/2" DIA. STEEL	50.00	8.8	440.0
76	1.1/2" DIA. STEEL	50.00	8.8	440.0
77	1.1/2" DIA. STEEL	50.00	8.8	440.0
78	1.1/2" DIA. STEEL	50.00	8.8	440.0
79	1.1/2" DIA. STEEL	50.00	8.8	440.0
80	1.1/2" DIA. STEEL	50.00	8.8	440.0
81	1.1/2" DIA. STEEL	50.00	8.8	440.0
82	1.1/2" DIA. STEEL	50.00	8.8	440.0
83	1.1/2" DIA. STEEL	50.00	8.8	440.0
84	1.1/2" DIA. STEEL	50.00	8.8	440.0
85	1.1/2" DIA. STEEL	50.00	8.8	440.0
86	1.1/2" DIA. STEEL	50.00	8.8	440.0
87	1.1/2" DIA. STEEL	50.00	8.8	440.0
88	1.1/2" DIA. STEEL	50.00	8.8	440.0
89	1.1/2" DIA. STEEL	50.00	8.8	440.0
90	1.1/2" DIA. STEEL	50.00	8.8	440.0
91	1.1/2" DIA. STEEL	50.00	8.8	440.0
92	1.1/2" DIA. STEEL	50.00	8.8	440.0
93	1.1/2" DIA. STEEL	50.00	8.8	440.0
94	1.1/2" DIA. STEEL	50.00	8.8	440.0
95	1.1/2" DIA. STEEL	50.00	8.8	440.0
96	1.1/2" DIA. STEEL	50.00	8.8	440.0
97	1.1/2" DIA. STEEL	50.00	8.8	440.0
98	1.1/2" DIA. STEEL	50.00	8.8	440.0
99	1.1/2" DIA. STEEL	50.00	8.8	440.0
100	1.1/2" DIA. STEEL	50.00	8.8	440.0

- NOTE**
1. ALL DIMENSIONS ARE IN MM.
 2. ALL DIMENSIONS ARE OF WELD STEEL, IS 2062 (ASTM A36).
 3. THE COLUMN IN GENERAL FOLLOWING IS BOLTED, 1.1/2" DIA. A307.
 4. ALL STEEL IS 1.1/2" DIA. A307 OR 1.1/2" DIA. A307.
 5. ALL DIMENSIONS ARE IN MM.
 6. ALL DIMENSIONS ARE IN MM.
 7. ALL DIMENSIONS ARE IN MM.
 8. ALL DIMENSIONS ARE IN MM.
 9. ALL DIMENSIONS ARE IN MM.
 10. ALL DIMENSIONS ARE IN MM.

Refer to M/s. Naga Enterprises
for Construction of Drawing
13/03/2014

PROJECT MANAGER
PLANNING & ENGINEERING
DESIGN & CONSTRUCTION

SCALE 1:20
FOR DETAILS SCALE 1:10

REVISIONS

NO.	DESCRIPTION	DATE
1	ISSUED FOR TENDER	13/03/2014
2	ISSUED FOR TENDER	13/03/2014
3	ISSUED FOR TENDER	13/03/2014
4	ISSUED FOR TENDER	13/03/2014
5	ISSUED FOR TENDER	13/03/2014
6	ISSUED FOR TENDER	13/03/2014
7	ISSUED FOR TENDER	13/03/2014
8	ISSUED FOR TENDER	13/03/2014
9	ISSUED FOR TENDER	13/03/2014
10	ISSUED FOR TENDER	13/03/2014

APPROVED

PROJECT MANAGER
PLANNING & ENGINEERING
DESIGN & CONSTRUCTION