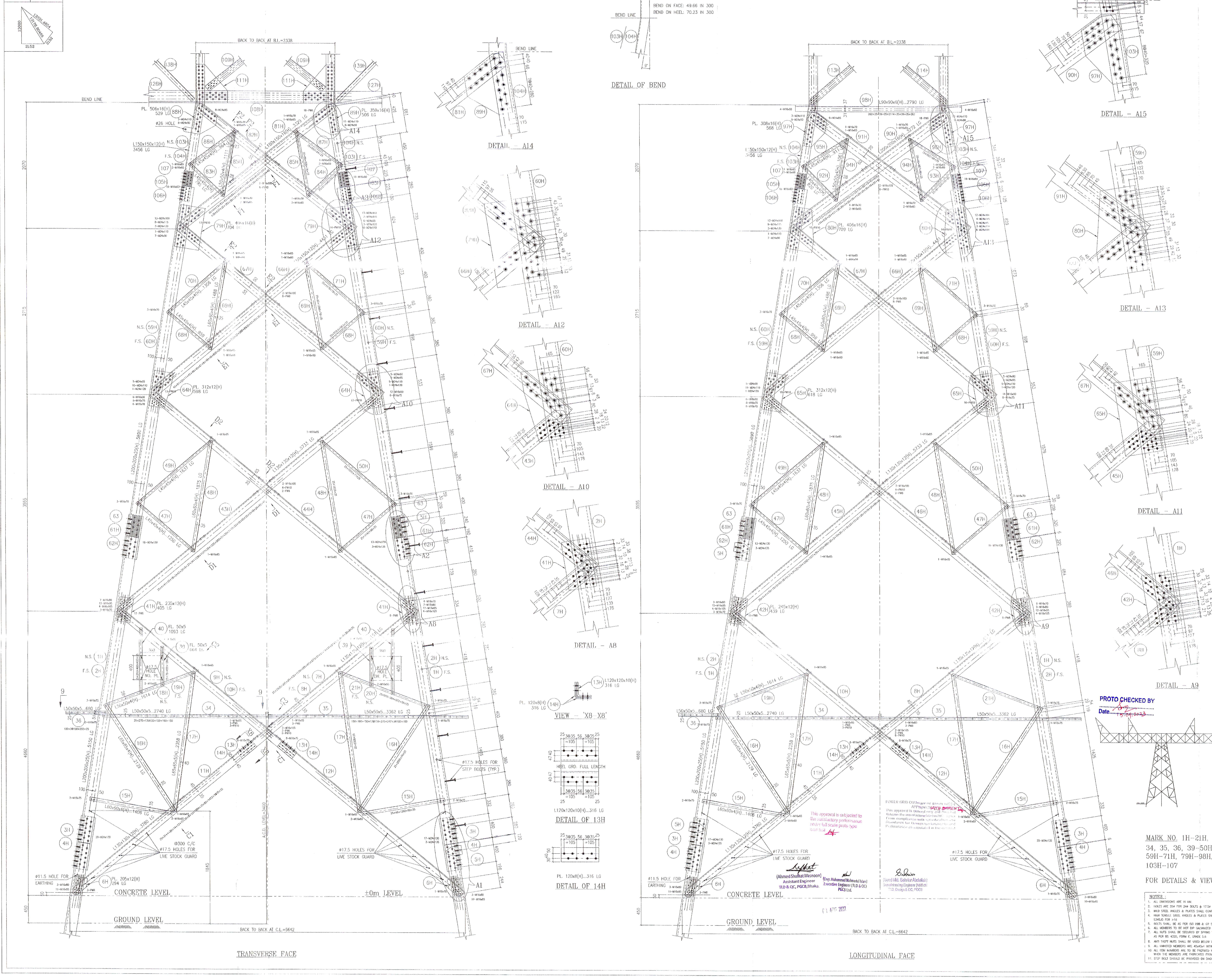
TOWER SLOPE	
TAN B	0.16553333
2TAN B	0.33106666
FACE	1.01360805
DEVELOP	1.0270358



MARK NO.	QTY/TWR PC	SECTION MM	LENGTH MM	WT/MTR KG	WT/PC KG	TOTAL WT KG
2T-1H	2	L200X200X25 HT	5150	73.90	380.59	761.18
2T-2H	2	L200X200X25 HT	5150	73.90	380.59	761.18
2T-3H	4	L200X200X20 HT	886	60.00	53.16	212.64
2T-4H	8	PL190X20 HT	886	157.00	26.43	211.44
2T-5H	8	PL150X8 HT	265	62.80	2.50	20.00
2T-6H	8	PL205X12 HT	294	94.20	5.68	45.44
2T-7H	1	L130X130X12 HT	3651	23.50	85.80	85.80
2T-8H	3	L130X130X12 HT	3651	23.50	85.80	257.40
2T-9H	1	L130X130X12 HT	3651	23.50	85.80	85.80
2T-10H	3	L130X130X12 HT	3651	23.50	85.80	257.40
2T-11H	4	L130X130X12 HT	3780	23.50	88.83	355.32
2T-12H	4	L130X130X12 HT	3780	23.50	88.83	355.32
2T-13H	8	L120X120X10 HT	316	18.20	5.75	46.00
2T-14H	16	PL120X8 HT	316	62.80	2.38	38.08
2T-15H	8	L60X60X4 HT	1406	3.70	5.20	41.60
2T-16H	8	L65X65X4 HT	2129	4.00	8.52	68.16
2T-17H	8	L65X65X5 HT	2358	4.90	11.55	92.40
2T-18H	1	L50X50X4 HT	1614	3.00	4.84	4.84
2T-19H	3	L50X50X4 HT	1614	3.00	4.84	14.52
2T-20H	1	L50X50X4 HT	1614	3.00	4.84	4.84
2T-21H	3	L50X50X4 HT	1614	3.00	4.84	14.52
2T-22H	4	L50X50X4 HT	2175	3.00	6.53	26.12
2T-23H	4	L60X60X4 HT	3260	3.70	12.06	48.24
2T-24H	4	L60X60X4 HT	3315	3.70	12.27	49.08
2T-25H	4	L45X45X4 HT	972	2.70	2.62	10.48
2T-26H	4	L45X45X4 HT	1005	2.70	2.71	10.84
2T-27H	24	PL120X6 HT	165	47.10	0.93	22.32
2T-28H	40	PL120X6 HT	165	47.10	0.93	37.20
2T-29H	4	L45X45X4 HT	2030	2.70	5.48	21.92
2T-30H	4	L55X55X4 HT	3146	3.40	10.70	42.80
2T-31H	4	L55X55X4 HT	3206	3.40	10.90	43.60
2T-32H	4	L45X45X4 HT	802	2.70	2.17	8.68
2T-33H	4	L45X45X4 HT	759	2.70	2.05	8.20
2T-41H	4	PL235X12 HT	405	94.20	8.97	35.88
2T-42H	4	PL245X12 HT	439	94.20	10.13	40.52
2T-43H	2	L130X130X12 HT	5733	23.50	134.73	269.46
2T-44H	2	L130X130X12 HT	5733	23.50	134.73	269.46
2T-45H	2	L130X130X12 HT	5733	23.50	134.73	269.46
2T-46H	2	L130X130X12 HT	5733	23.50	134.73	269.46
2T-47H	8	L45X45X4 HT	1250	2.70	3.38	27.04
2T-48H	8	L60X60X4 HT	1875	3.70	6.94	55.52
2T-49H	4	L45X45X4 HT	1637	2.70	4.42	17.68
2T-50H	4	L45X45X4 HT	1637	2.70	4.42	17.68
2T-51H	4	L45X45X4 HT	1668	2.70	4.50	18.00
2T-52H	4	L55X55X4 HT	2462	3.40	8.37	33.48
2T-53H	4	L55X55X4 HT	2505	3.40	8.52	34.08
2T-54H	4	L45X45X4 HT	716	2.70	1.93	7.72
2T-55H	4	L45X45X4 HT	750	2.70	2.03	8.12
2T-56H	4	L45X45X4 HT	1592	2.70	4.30	17.20
2T-57H	4	L50X50X4 HT	2362	3.00	7.09	28.36
2T-58H	4	L50X50X4 HT	2419	3.00	7.26	29.04
2T-59H	2	L200X200X20 HT	5890	60.00	353.40	706.80
2T-60H	2	L200X200X20 HT	5890	60.00	353.40	706.80
2T-61H	4	L200X200X20 HT	726	60.00	43.56	174.24
2T-62H	8	PL190X20 HT	726	157.00	21.66	173.28
2T-63	8	PL155X5	360	39.25	2.19	17.52
2T-64H	4	PL312X12 HT	598	94.20	17.58	70.32
2T-65H	4	PL312X12 HT	618	94.20	18.16	72.64
2T-66H	4	L150X150X12 HT	4431	27.30	120.97	483.88
2T-67H	4	L150X150X12 HT	4431	27.30	120.97	483.88
2T-68H	8	L45X45X4 HT	959	2.70	2.59	20.72
2T-69H	8	L60X60X4 HT	1488	3.70	5.51	44.08
2T-70H	4	L45X45X4 HT	1306	2.70	3.53	14.12
2T-71H	4	L45X45X4 HT	1306	2.70	3.53	14.12
2T-72H	4	L45X45X4 HT	1305	2.70	3.52	14.08
2T-73H	4	L45X45X4 HT	1784	2.70	4.82	19.28
2T-74H	4	L45X45X4 HT	1839	2.70	4.97	19.88
2T-75H	56	PL120X6 HT	175	47.10	0.99	55.44
2T-76H	4	L45X45X4 HT	1251	2.70	3.38	13.52
2T-77H	4	L45X45X4 HT	1784	2.70	4.82	19.28
2T-78H	4	L45X45X4 HT	1846	2.70	4.98	19.92
2T-79H	4	PL406X16 HT	704	125.60	35.90	143.60
2T-80H	4	PL406X16 HT	709	125.60	36.15	144.60
2T-81H	2	L150X150X16 HT	3329	35.80	119.18	238.36
2T-82H	2	L150X150X16 HT	3329	35.80	119.18	238.36
2T-83H	2	L45X45X4 HT	795	2.70	2.15	4.30
2T-84H	2	L45X45X4 HT	795	2.70	2.15	4.30
2T-85H	4	L50X50X4 HT	1111	3.00	3.33	13.32
2T-86H	2	L45X45X4 HT	964	2.70	2.60	5.20
2T-87H	2	L45X45X4 HT	964	2.70	2.60	5.20
2T-88H	2	PL506X16 HT	529	125.60	33.62	67.24
2T-89H	2	PL359X16 HT	506	125.60	22.82	45.64
2T-90H	2	L200X200X16 HT	3272	48.50	158.69	317.38
2T-91H	2	L200X200X16 HT	3272	48.50	158.69	317.38
2T-92H	2	L45X45X4 HT	820	2.70	2.21	4.42
2T-93H	2	L45X45X4 HT	820	2.70	2.21	4.42
2T-94H	4	L50X50X4 HT	1061	3.00	3.18	12.72
2T-95H	2	L45X45X4 HT	911	2.70	2.46	4.92
2T-96H	2	L45X45X4 HT	911	2.70	2.46	4.92
2T-97H	4	PL308X16 HT	568	125.60	21.97	87.88
2T-98H	2	L90X90X6 HT	2790	8.20	22.88	45.76
2T-99H	4	L45X45X4 HT	1046	2.70	2.82	11.28
2T-100H	4	L45X45X4 HT	1274	2.70	3.44	13.76
2T-101H	4	L45X45X4 HT	1374	2.70	3.71	14.84
2T-102H	4	L45X45X4 HT	968	2.70	2.61	10.44
2T-103H	2	L150X150X12 HT	3456	27.30	94.35	188.70
2T-104H	2	L150X150X12 HT	3456	27.30	94.35	188.70
2T-105H	4	L130X130X12 HT	506	23.50	11.89	47.56
2T-106H	8	PL140X12 HT	506	94.20	6.67	53.36
2T-107	8	PL100X8	250	62.80	1.57	12.56
TOTAL (BLACK WEIGHT)						10906.32
Bill of material for NO. PL. & DN. PL. Members used only for +0m, +1.5m & +3m Extn.						
2T-39	2	FL50X5	664	2.00	1.33	2.66
2T-40	2	FL50X5	1093	2.00	2.19	4.38
TOTAL						7.04
Bill of material for A.C.D. Members used only for +0m & +1.5m Extn.						
2T-34	4	L50X50X5	2740	3.80	10.41	41.64
2T-35	4	L50X50X5	3362	3.80	12.78	51.12
2T-36	4	L50X50X5	680	3.80	2.58	10.32
2T-37	4	L50X50X5	757	3.80	2.88	11.52
2T-38	4	L50X50X5	3974	3.80	15.10	60.40
SPIKE	280	Ø10 ROD	175	0.81	0.14	39.20
TOTAL						214.20
GRAND TOTAL (BLACK WEIGHT)						11127.56
GRAND TOTAL WITH 3.5% GALVANIZING WEIGHT						11517.02

Bill of material for M.S.Hot Dip Galvanized Anti Theft Bolts & Nuts , Grade 5.6/5

	QTY		LENGTH	QTY With 5%	UNIT Wt.(Kg)	Wt. (Kg)	Wt.(Kg) With 5%
HRH Bolts & Nuts	26	M16	50	27	0.146	3.80	3.94
do	110	M16	55	116	0.154	16.94	17.86
do	344	M16	60	361	0.162	55.73	58.48
do	128	M16	65	134	0.170	21.76	22.78
do	128	M16	70	134	0.178	22.78	23.85
do	236	M16	75	248	0.186	43.90	46.13
do	88	M16	80	92	0.194	17.07	17.85
do	4	M16	85	4	0.202	0.81	0.81
do	220	M16	90	231	0.210	46.20	48.51
do	192	M16	95	202	0.218	41.86	44.04
do	8	M16	100	8	0.226	1.81	1.81
do	56	M16	105	59	0.234	13.10	13.81
H.D.G.Step Bolts	58	M16	270	61	0.560	32.48	34.16
ANTI THEFT NUT	1598	FOR M16		1677	0.031	49.54	51.99
ANTI THEFT NUT	280	FOR M10		294	0.009	2.52	2.65
H.D.G.Spring Washers	1598	FOR M16		1677	0.009	14.38	15.09
H.D.G.Flat Washers	1598	FOR M16		1677	0.011	17.58	18.45
H.D.G.Pack Washers to suit M16 Bolt							
do	0		5thk	0	0.018	0.00	0.00
do	48		6thk	50	0.021	1.01	1.05
do	152		8thk	160	0.028	4.26	4.48
do	140		10thk	147	0.036	5.04	5.29
TOTAL (BLACK WEIGHT)						412.55	433.02

	QTY		LENGTH	QTY With 5%	UNIT Wt.(Kg)	Wt. (Kg)	Wt.(Kg) With 5%
HRH Bolts & Nuts	116	M24	90	122	0.539	62.52	65.76
do	96	M24	95	101	0.557	53.47	56.26
do	100	M24	100	105	0.575	57.50	60.38
do	0	M24	105	0	0.593	0.00	0.00
do	154	M24	110	162	0.611	94.09	98.98
do	46	M24	115	48	0.629	28.93	30.19
do	8	M24	120	8	0.647	5.18	5.18
do	288	M24	130	302	0.683	196.70	206.27
do	24	M24	135	25	0.701	16.82	17.53
ANTI THEFT NUT	832	FOR M24		873	0.102	84.86	89.05
H.D.G.Spring Washers	832	FOR M24		873	0.260	216.32	226.98
H.D.G.Flat Washers	832	FOR M24		873	0.300	249.60	261.90
H.D.G.Pack Washers to suit M24 Bolt							
do	68		6thk	71	0.045	3.06	3.20
do	0		8thk	0	0.06	0.00	0.00
do	112		10thk	118	0.075	8.40	8.85
TOTAL (BLACK WEIGHT)						1077.47	1130.50
TOTAL WITH 3.5% GALVANIZING WEIGHT						1542.18	1618.24

MARK NO. 1H–21H, 34, 35, 36, 39–50H, 59H–71H, 79H–98H, 103H–107

FOR DETAILS & VIEWS REFER SHEET 2 OF 4

NOTES :
1. ALL DIMENSIONS ARE IN MM.
2. HOLES ARE 26ø FOR 24ø BOLTS & 17.5ø FOR 16ø BOLTS UNLESS OTHERWISE NOTED.
3. MILD STEEL ANGLES & PLATES SHALL CONFORM BSEN10025 GR S275JR.
4. HIGH TENSILE STEEL ANGLES & PLATES SHALL CONFORM BSEN 10025 GR S355J0 FOR ≤16 & S345J0 FOR >16
5. BOLTS SHALL BE AS PER ISO 898 & GR 5.6
6. ALL MEMBERS TO BE HOT DIP GALVANIZED AS PER ISO 1461
7. ALL NUTS SHALL BE SECURED BY SPRING WASHER AS PER BS 4464, TYPE B & FLAT WASHER AS PER BS 4320, FORM E, GRADE 5.6
8. ANTI THEFT NUTS SHALL BE USED BELOW WAIST LEVEL WITH GRADE 5.
9. ALL UNNOTED MEMBERS ARE 45x45x4 WITH 23 BACK MARK
10. ALL ITEM NUMBERS ARE TO BE PREFIXED WITH LETTERS-2T-XXXH H SHALL BE STAMPED WHEN THE MEMBERS ARE FABRICATED FROM HIGH TENSILE STEEL
11. STEP BOLT SHOULD BE PROVIDED ON DIAGONALLY OPPOSITE LEGS.

NO.	DATE	DESCRIPTION	DRAWN	CHECKED	APPROVED

CLIENT :	POWER GRID COMPANY OF BANGLADESH LTD.
CONTRACTOR :	HG POWER TRANSMISSION Sdn. Bhd.
MANUFACTURER :	Shilpa Steel & Power Ltd. Nagpur, India
PROJECT NAME :	DESIGN, SUPPLY, INSTALLATION, TESTING & COMMISSIONING OF 230kV AND 132kV TRANSMISSION LINES, ON TURNKEY BASIS
CONTRACT NO.	PGCB/KFW/BMZ.2014.67.976/2018/Package-1.2 Dated 18.05.2020
DRAWING TITLE :	STRUCTURAL DRAWING FOR TOWER TYPE 2T ±0m BOTTOM PART-I
SCALE	1:20
DRAWN BY	R. PAUL
CHECKED BY	R. AHMED
DRAWING NO.	HGPT/PGCB/KfW-1.2/2T/SD/0M
SHEET	1 OF 4
SIZE	A0
REV	0

HG POWER TRANSMISSION SDN.BHD.