A3

GENERAL DESCRIPTION

SCENE:
The basic wind speed of the solar bracket is related to the elevation angle of the photovoltaic panel. The basic wind speed for the elevation angle of 15, 25, 35, and 45 degrees is 40, 40, 35, and 31 m/s (3s time interval). The soil bearing capacity at the bottom of foundation should not be less than 100kPa. The support and foundation can be placed in flat terrian where the ground surface roughness category is C in ASCE 7-05 (B in GB50009-2001) .In some particular scene, such as island and mountain peak, site designer should recheck the foundation dedign and modify the drawing.

FOUNDATION SELECTION PRINCIPLE:
1.Selection of foundation grade shall be decided by bracket height, angle.

NOTICE:
1.Wind speed is 3 second gust;
2.If site basic wind velocity exceed the design basic wind speed, or soil bearing capacity at the bottom of foundation is less than 100kPa (most is quicksand or swampland), foundation drawing should be modified. HQ GTS or R&D can be contacted.

说明

支架及基础应用场景:
该太阳能支架设计的基本风速与光伏板仰角有关，仰角为15、25、35、45度的基本风速为40、40、35、31m/s （3S时距）。按照光伏支架高度的不同分为:低支架基础和高支架基础。所有基础所在位置的地基土承载力不小于100kPa。设计适用于美标C类（中标B类）地面粗糙度的平坦地区或稍有起伏地区，对于海岛或山峰等特殊地形的应用，需要站点设计人员根据实际情况对基础重新验算，并做相应的变形设计。

基础选型的一般原则:
1.根据支架高度、角度的不同选择基础;

注:
1.风速为3s时距;
2.若站点基本风速高于基本风速，或者地基土承载力低于100kPa(大部分为流沙或沼泽地区)，基础需重新设计。可以联系配套服务或机关研发人员。

客户:

签名:

分包商:

HUAWEI

签名:

项目:
Project:

备注:
Remark:

图名:
Drawing title:

备注: Sharp A Bracket 3.0 Foundation (High solar bracket)
Remark: A型支架3.0高杆基础 (高支架)

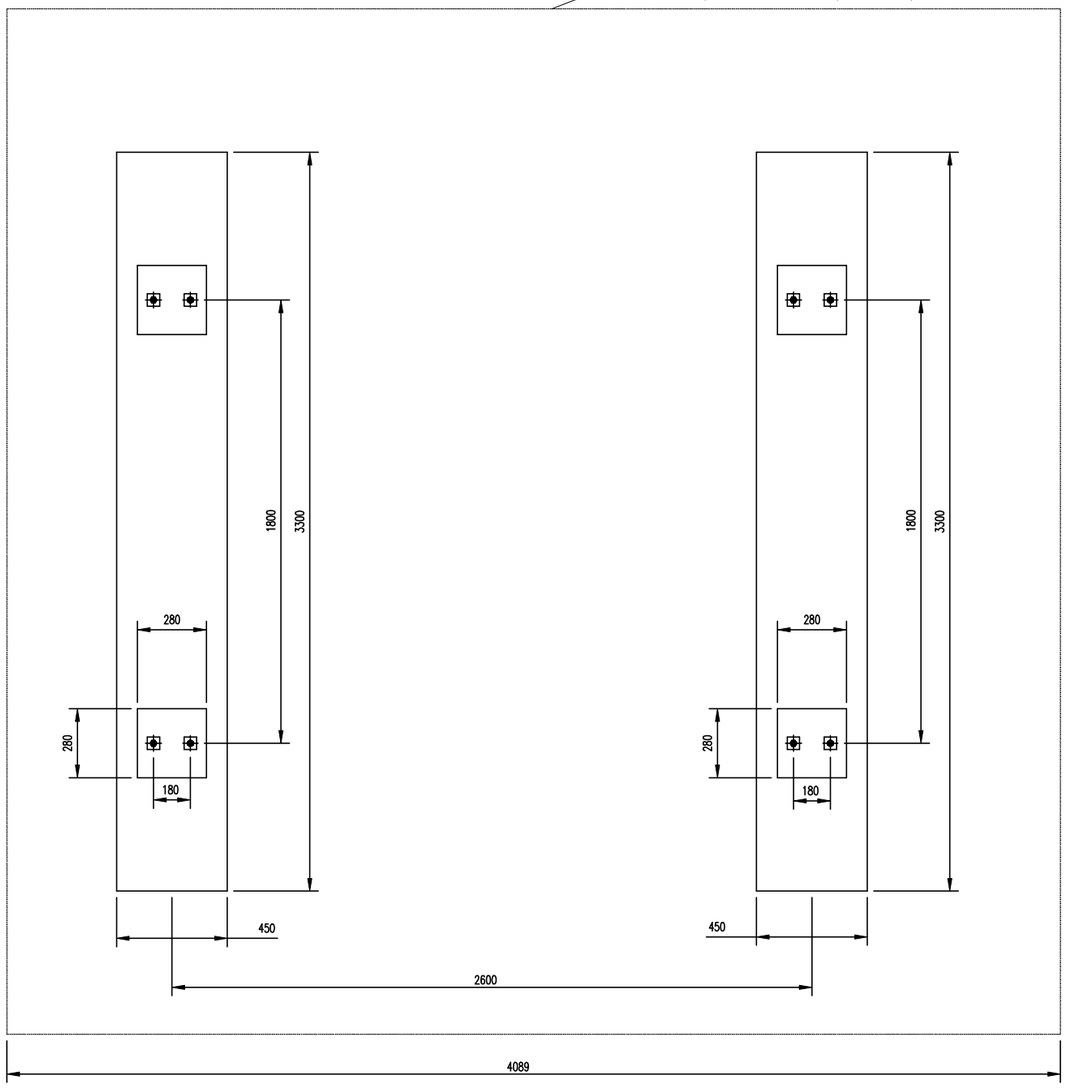
编码:Part-No:			
版本: Version:			
比例: Scale:		图号: NO.:	

结构编号:

设计: Designed:		
检查: Checked:		
审核: Verified:		
批准: Approved:		

A3

6X540W光伏组件轮廓线
Solar panel Contour(6X540W)



基础平面图 Foundation Plan

客户:

签名:

分包商:

HUAWEI

签名:

项目:
Project:

备注:
Remark:

图名:
Drawing title:

备注: Sharp A Bracket 3.0 Foundation (High solar bracket)
Remark: A型支架3.0条形基础 (高支架)

编码:Part-No.:

版本: Version:

比例: Scale:

图号: NO.:

结构编号:

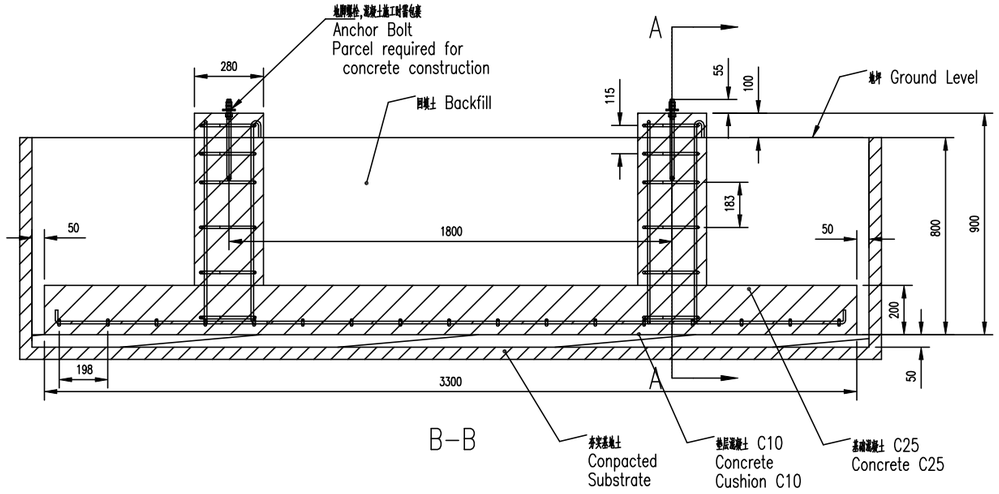
设计: Designed:

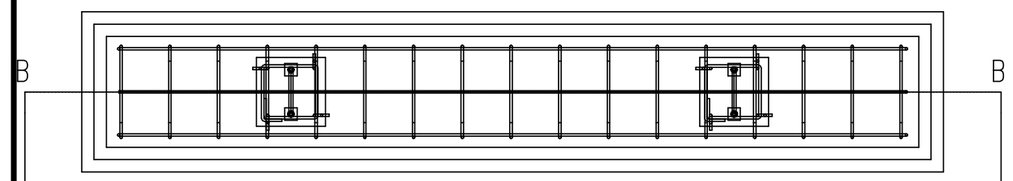
检查: Checked:

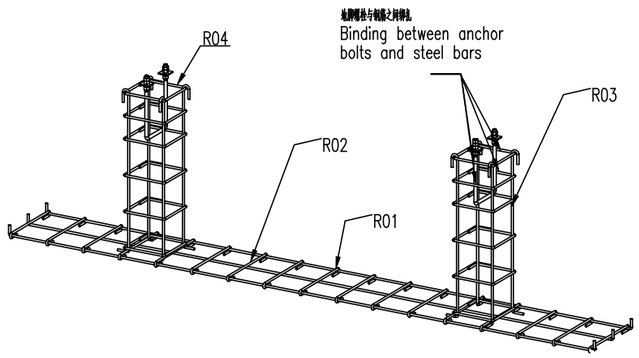
审核: Verified:

批准: Approved:

A3





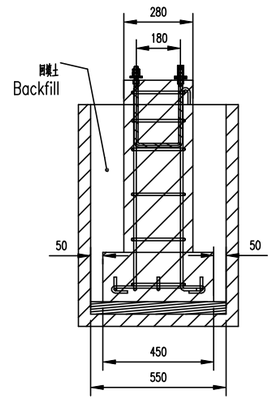


单条基础钢筋表 Steel Bar List of Each Foundation

编号 No.	直径 Dia. d(mm)	间距 Spacing (mm)	A (mm)	B (mm)	C (mm)	长度 Length (mm)	数量 Quantity	总长 Totle Length (m)	单位重量 Weight (Kg/m)	总重 Total Weigh (Kg)
R01	10	175	50	3200	50	3300	3	9.9	0.62	19.53
R02	10	198	50	350	50	450	17	7.7	0.62	
R03	10	190	50	800	50	900	8	7.2	0.62	
R04	10	/	210	210	70	560	12	6.7	0.62	

单条基础混凝土用量和开挖 Concrete and Excavation List of Each Foundation

基础混凝土 Concrete	(m^3)	0.407	垫层混凝土 Concrete Cushion	(m^3)	0.094
土方开挖 Excavation	(m^3)	1.59	土方回填 Backfill	(m^3)	1.1



钢筋外形图 Steel bar shape

编号No.	形状 Shape	长度 Length
R01	A B C	L=A+B+C
R02	A B C	L=A+B+C
R03	A B C	L=A+B+C
R04	A C B	L=2(A+B+C)

说明:

Notes:

1. 容许的施工误差:+/-3mm;
   Allow scope of Construction error: ±3mm;
2. 设计基本风速与仰角有关.
   基底土承载力不小于100kPa.
   The design basic wind speed is related to the elevation angle.
   Basal soil bearing capacity(fak) should be more than 100Kpa,
3. 除特别说明外,所有长度的单位均为mm;
   All dimensions are millimeter unless otherwise stated;
4. 钢筋屈服强度:335MPa(d=10mm);
   Yield strength (yield point) of steel: 335MPa(d=10mm);
5. 基础混凝土:C25;垫层混凝土:C10
   Concrete of Foundation:C25; Concrete Cushion: C10
6. 若未特别说明,基础保护层厚度一律采用50mm;
   Thickness of Concrete Cover is 50mm unless otherwise stated;
7. 浇注混凝土前必须校正基础模板位置和尺寸正确;
   Verify base dimension before casting concrete;
8. 基础浇注过程中必须进行振捣;
   Vibration of concrete should be performed during pouring concrete;
9. 基础浇注完成后需养护至少3天;
   Concrete surface should be kept wet for 3 days after casting;
10. 地脚螺栓绑扎在钢筋R04上.
    Anchor bolt could be fixed on R04.

客户:

签名:

分包商:

HUAWEI

签名:

项目:
Project:

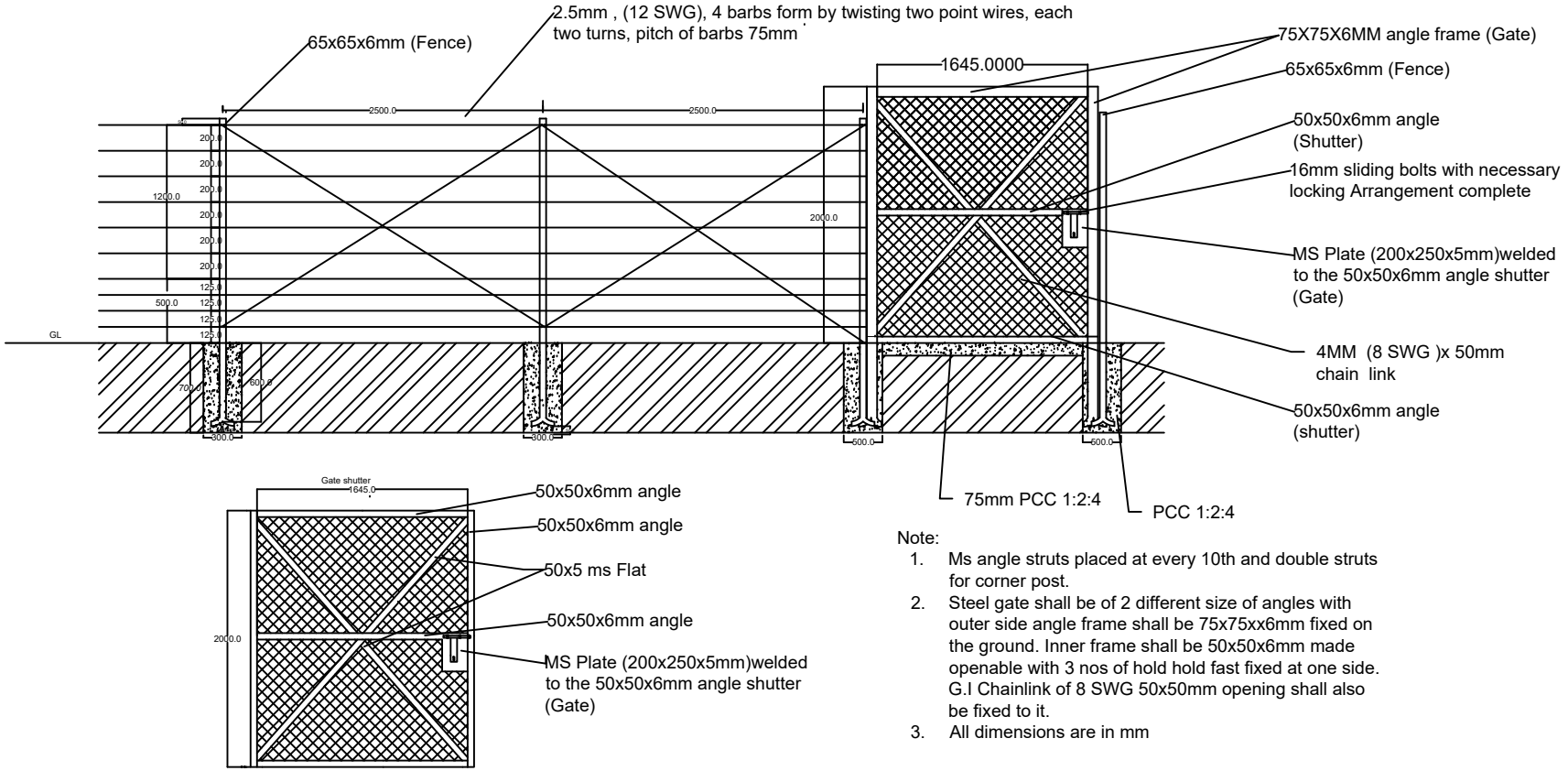
备注:
Remark:

图名:
Drawing title:

备注: Sharp A Bracket 3.0 Foundation (High solar bracket)
Remark: A型支架3.0条形基础 (高支架)

编码:Part-No:			
版本: Version:			
比例: Scale:		图号: NO.:	
结构编号:			
设计: Designed:			
检查: Checked:			
审核: Verified:			
批准: Approved:			

BARBED WIRE FENCING AND GATE DRAWING

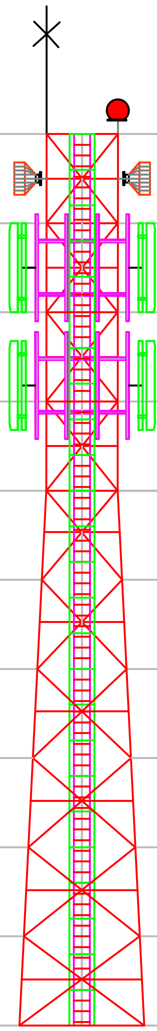


Note:

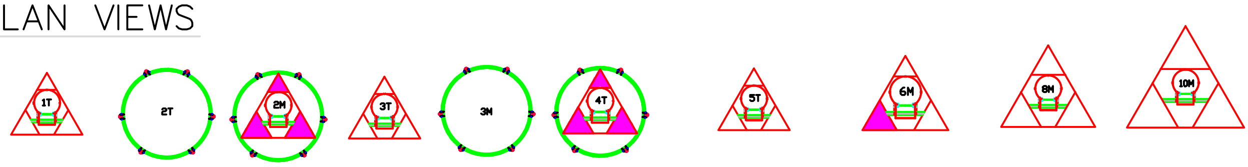
1. Ms angle struts placed at every 10th and double struts for corner post.
2. Steel gate shall be of 2 different size of angles with outer side angle frame shall be 75x75xx6mm fixed on the ground. Inner frame shall be 50x50x6mm made openable with 3 nos of hold hold fast fixed at one side. G.I Chainlink of 8 SWG 50x50mm opening shall also be fixed to it.
3. All dimensions are in mm

	Title : Barbed wire fencing	BHUTAN TELECOM LIMITED	
	Checked by:	Approved by:	

LEVEL	FACE WIDTH	PLATFORM	LEG JOINT NAME	LEG LENGTH	LEGS SIZE	PANEL NO	LENGTH(METER)	DIAGONALS	PANEL TOP- HORIZONTALS	PANEL MID- HORIZONTALS	PLAN BRACING	SEC. BRACING
25000	2000		A									
22500	2000			2500	65x65x6	1	2.5	50x50x4	50x50x4	45x45x04	45x45x04	
20000	2000	Working Platform	B	2500		2	2.5					
17500	2000	Working Platform		2500	75X75X6	3	2.5	55x5	50x50x4	45x45x04	45x45x04	
15000	2000		C	2500		4	2.5	60x60x5				
12500	2250			2503	100x100x10	5	2.5			50x50x4		
10000	2500	Rest Platform	D	2503		6	2.5	50x5			50x50x4	
7500	2750			2503	120x120x10	7	2.5	50x50x5		50x50x4		
5000	3000		E	2503		8	2.5					
2500	3250			2503	130x130x12	9	2.5	55x55x5		50x50x4	50x50x4	
0000	3500		F	2503		10	2.5					

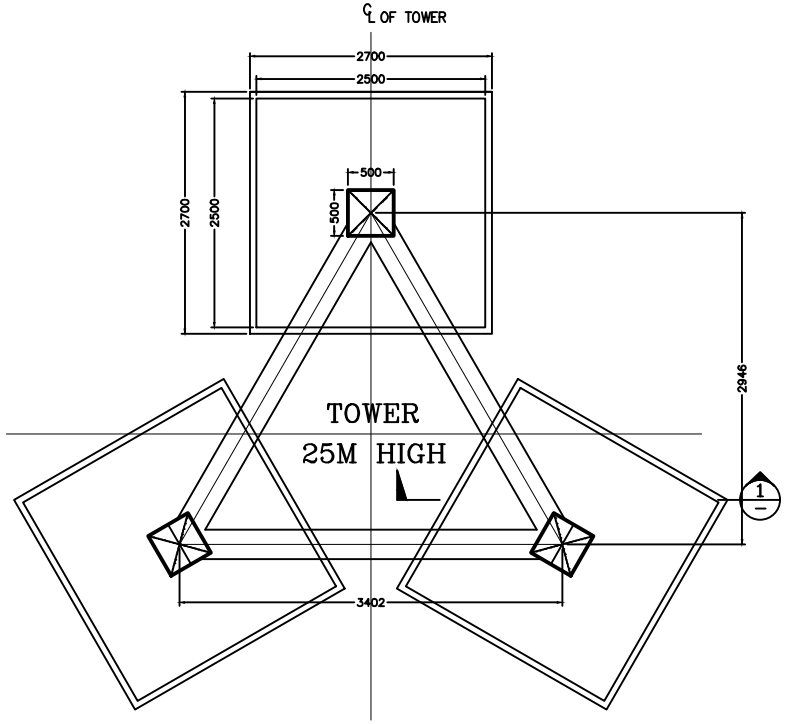


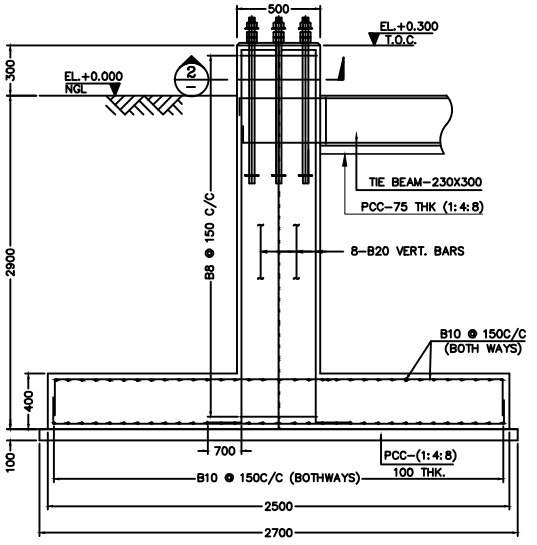
PLAN VIEWS



1)Remote Radio Head– 6+4nos
(Total Weight 270kgs.)
2)Sectoral Antennas – 6+4nos
(Total Weight 242kgs.)
3)Microwave Antennas (0.9m)–2nos
(Total Weight 50kgs.)
4)Microwave Antennas (1.2m)–2nos
(Total Weight 60kgs.)
5)Antennas Mounting Structure
(Total Weight 270kgs.)

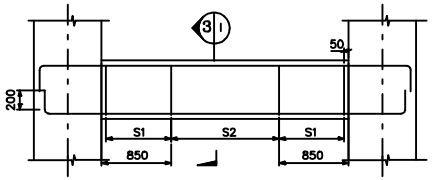
TITLE	25 METER TOWER	Wind Speed	180 KMPH	Design	TIA/EIA–222 G
SUB. TITLE	TRIANGULAR ANGULAR TOWER	Deflection	< 1.0 Degree	Rev:	
Drawing	BT - 2024 Project	Loading	892 kgs.	Drawn Date	08–12–2023
BHUTAN TELECOM LTD.		Tower Weight 4450 kgs.			



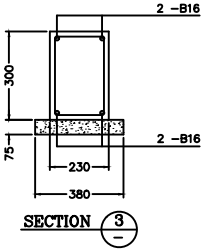


SECTION 1

FOUNDATION KEY PLAN

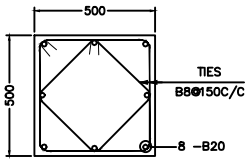


TIE BEAM (TYP DETAILS)



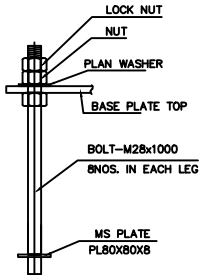
SECTION 3

STIRRUP DETAILS
S1:-2 LEGGED Y8 @ 100 C/C
S2:-2 LEGGED Y8 @ 200 C/C



SECTION 2

COLUMN 500X500



ANCHOR BOLT

NOTES

1. ALL DIMENSIONS ARE IN MM UNLESS NOTED OTHERWISE.
2. USE M20 GRADE CONCRETE AND Fe 500 GRADE FOR STEEL.
3. CLEAR COVER TO MAIN REINFORCEMENT:-
   (a) 50MM FOR FOUNDATION (b) 25MM FOR BEAMS
   (c) 40MM FOR COLUMNS
4. PRIOR TO AND DURING CONCRETING ALL BOLTS SHALL BE SECURELY HELD IN POSITION BY USE OF TEMPLATE.
5. BEFORE COMMENCEMENT OF CONSTRUCTION USING THIS DESIGN, CLIENT/CONTRACTOR SHALL CARRY OUT DETAILED SOIL INVESTIGATION OF EVERY SITE.
6. THIS FOUNDATION DESIGN SHALL NOT BE USED IN CASE HIGHLY SOIL ARE FOUND AT ANY DEPTH DURING SOIL INVESTIGATION.
7. CONCRETE SHALL BE MECHANICALLY MIXED & VIBRATED.
8. SPLICING OF BARS SHALL NOT BE MORE THAN 50% AT ANY LOCATION.
9. PROPER CURING OF CONCRETE SHALL BE DONE.
10. BENDING OF BARS SHALL BE AS PER IS:2502.
11. ANY DISCREPANCY SHOULD BE BROUGHT TO THE CONSULTANT'S ATTENTION.

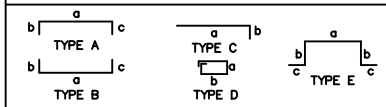
GENERAL DETAILS

S.No	DESCRIPTION	DETAILS
1	SOIL BEARING CAPACITY	10.00 T/SQM
2	DRY DENSITY OF SOIL	1.8 T/SQM
3	ANGLE OF REPOSE	30.00 DEGREE

BILL OF MATERIALS

ITEM	UNIT	TOTAL
EXCAVATION	CUM	66.0
PCC-(1:4:8)	CUM	2.45
RCC-M20	CUM	10.2
STEEL-Fe500	KG	860
CHAIRS SHALL BE PROVIDED WHEREEVER REQUIRED		

BAR BENDING SCHEDULE



REVISION NOTES

REV. NO.	DESCRIPTION		DATE	SIGN.
DRAWN	CHECKED	APPROVED	DATE	SCALE
Bhutan Telecom	Bhutan Telecom	Bhutan Telecom	14-12-2023	NTS

CLIENT: BHUTAN TELECOM LTD.

DESIGN BY: BHUTAN TELECOM LTD.

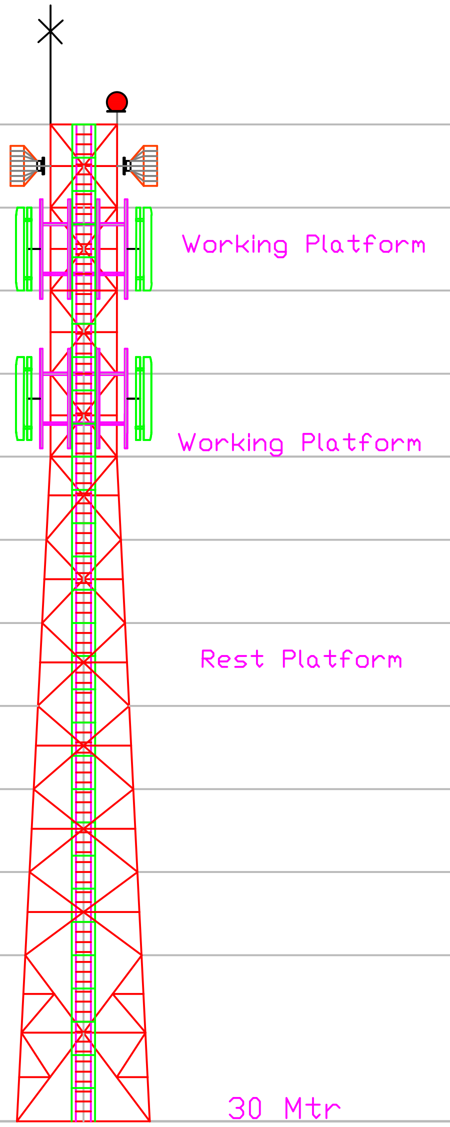
PROJECT: GENERIC ISOLATED FOUNDATION DESIGN BHUTAN

TITLE : FOUNDATION DETAILS FOR 25M HIGH TRIANGULAR TOWER SBC : 10 T/SQM

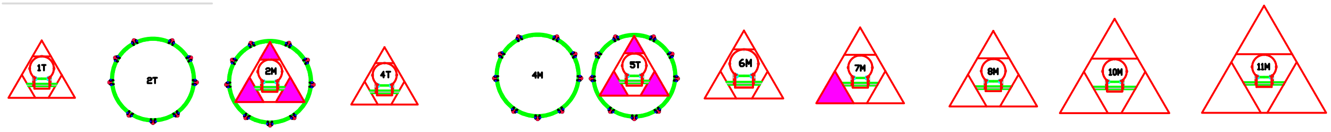
DRAWING No.	SH. NO.	REV.
BT-2024 Project		

LEVEL	FACE WIDTH	PANEL NO	LENGTH (METER)	DIAGONALS	PANEL TOP- HORIZONTALS	PANEL MID- HORIZONTALS	PLAN BRACING	SEC. BRACING	LEGS SIZE	LEG LENGTH	LEG JOINT NAME
30000	2000										A
27500	2000	1	2.5	50x50x4	50x50x4	45x45x04	45x45x04		65x65x6	2500	
25000	2000	2	2.5							2500	B
22500	2000	3	2.5	55x5	50x50x4	45x45x04	45x45x04		75X75X6	2500	
20000	2000	4	2.5	60x60x5						2500	C
17500	2250	5	2.5			50x50x4			100x100x10	2503	
15000	2500	6	2.5	50x5			50x50x4			2503	D
12500	2750	7	2.5	50x50x5		50x50x4			120x120x10	2503	
10000	3000	8	2.5							2503	E
7500	3250	9	2.5	55x55x5		50x50x4	50x50x4		130x130x12	2503	
5000	3500	10	2.5							2503	F
0000	4000	11	5	65x65x6		50x50x4	50x50x4	45x45x4	150x150x12	5006	G

PLATFORM

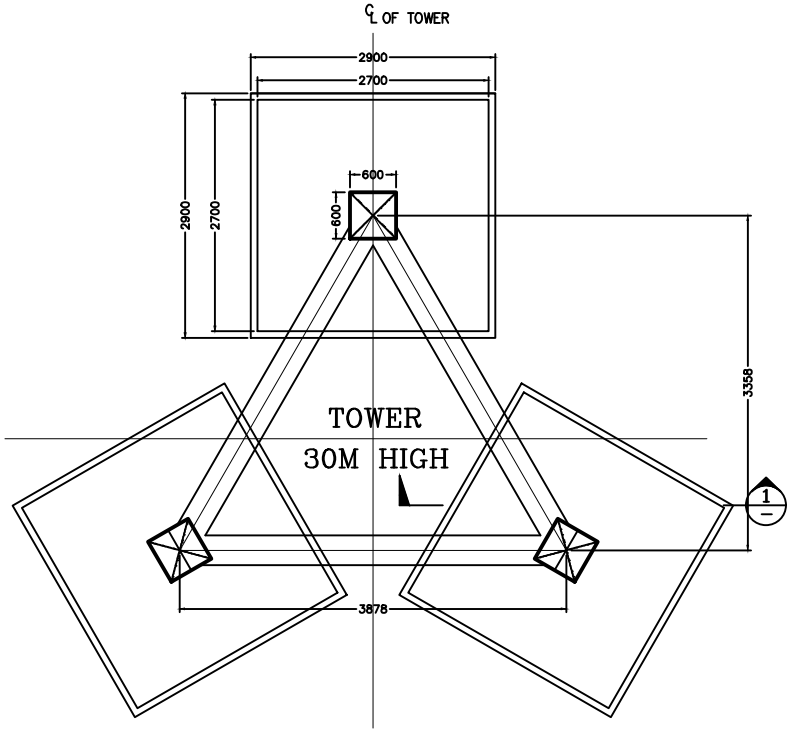


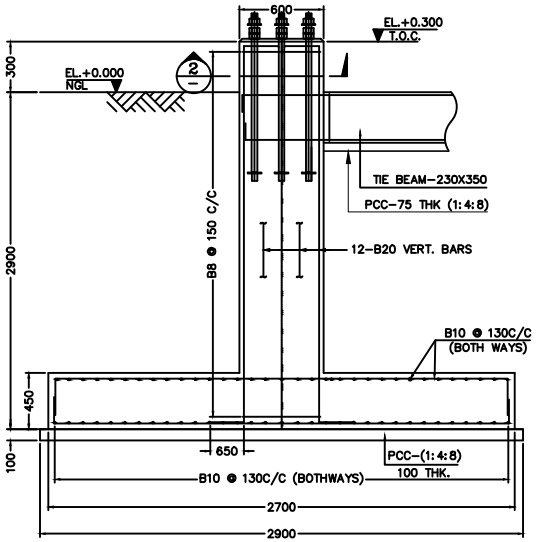
PLAN VIEWS



1)Remote Radio Head-9nos (Total Weight 245kgs.)
2)Sectoral Antennas -9nos (Total Weight 215kgs.)
3)Microwave Antennas 0.6m-2nos (Total Weight 50kgs.)
4)Microwave Antennas 0.9m-2nos (Total Weight 60kgs.)
5)Microwave Antennas 1.2m-2nos (Total Weight 60kgs.)
6)Microwave Antennas 1.8m-1nos (Total Weight 40kgs.)
7)Antennas Mounting Structure (Total Weight 270kgs.)

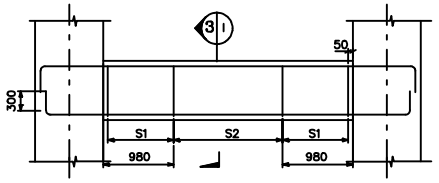
TITLE: 30 METER TOWER		Wind Speed	180 KMPH	Design	TIA/EIA-222 G
SUB. TITLE: TRIANGULAR ANGULAR TOWER		Deflection	< 1.0 Degree	Rev:	
Drawing: BT - 2024 Project		Loading	935 kgs.	Drawn Date	08-12-2023
BHUTAN TELECOM LTD		Tower Weight 5750 kgs.			



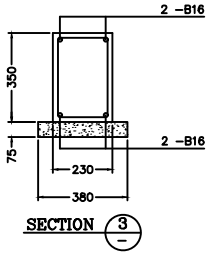


SECTION 1

FOUNDATION KEY PLAN

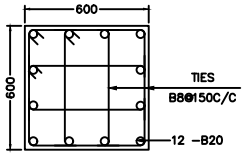


TIE BEAM (TYP DETAILS)



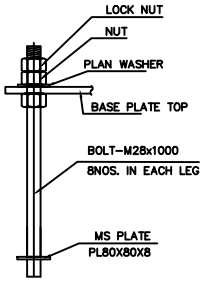
SECTION 3

STIRRUP DETAILS
S1:-2 LEGGED Y8 @ 100 C/C
S2:-2 LEGGED Y8 @ 200 C/C



SECTION 2

COLUMN 600X600



ANCHOR BOLT

NOTES

1. ALL DIMENSIONS ARE IN MM UNLESS NOTED OTHERWISE.
2. USE M20 GRADE CONCRETE AND Fe 500 GRADE FOR STEEL.
3. CLEAR COVER TO MAIN REINFORCEMENT:-
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10. BENDING OF BARS SHALL BE AS PER IS:2502.
11. ANY DISCREPANCY SHOULD BE BROUGHT TO THE CONSULTANT'S ATTENTION.

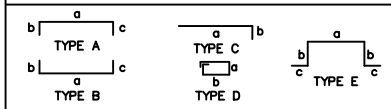
GENERAL DETAILS

S.No	DESCRIPTION	DETAILS
1	SOIL BEARING CAPACITY	10.00 T/SQM
2	DRY DENSITY OF SOIL	1.8 T/SQM
3	ANGLE OF REPOSE	30.00 DEGREE

BILL OF MATERIALS

ITEM	UNIT	TOTAL
EXCAVATION	CUM	76.3
PCC-(1:4:8)	CUM	2.85
RCC-M20	CUM	13.6
STEEL-Fe500	KG	1200
CHAIRS SHALL BE PROVIDED WHEREEVER REQUIRED		

BAR BENDING SCHEDULE



REVISION NOTES

REV. NO.	DESCRIPTION		DATE	SIGN.

DRAWN	CHECKED	APPROVED	DATE	SCALE
Bhutan Telecom	Bhutan Telecom	Bhutan Telecom	14-12-2023	NTS

CLIENT: BHUTAN TELECOM LTD.

DESIGN BY: BHUTAN TELECOM LTD.

PROJECT: GENERIC ISOLATED FOUNDATION DESIGN BHUTAN

TITLE : FOUNDATION DETAILS FOR 30M HIGH TRIANGULAR TOWER SBC : 10 T/SQM

DRAWING No.	SH. NO.	REV.
BT-2024 Project		