

40,30 AND 20 METER TOWERS FOR CELLULAR SYSTEMS

**GENERIC REQUIRMENTS
GR No: GR/TWR-11/01. DEC 2004**

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HISTORY SHEET

This is the first GR on 40,30 and 20 meter Towers for cellular systems and is numbered as GR No. GR/TWR-11/01. DEC 2004.

CONTENTS

S.No.	Topic	Page No.
1.	History sheet	ii
2.	References	iv

Part I

3.	Scope	1
4.	Functional and Technical Requirement	1-9

Part II

5.	Annex I (for Platform details)	10
6.	Annex II (for reference of the purchase)	11
7.	Abbreviations	12

Appendices:

A	BOM 40m tower	Appendix I
B	BOM 30m tower	Appendix II
C	BOM 20m tower	Appendix III
D	Design Drawings	Appendix IV

S. No.	IS Number	Year	Title
1.	IS : 209	1992	Zinc Ingot (specification)
2.	IS: 456	2000	General structure use of plain and reinforced concret
3.	IS : 613	2000	Copper rods and bars for electrical purposes - specification
4.	IS : 800	1984	Code of practice for General Construction in steel
5.	IS : 875	1987	Code of practice for design Load (Other Then Earthquake) for Buildings and structures.(part 3)- Wind Loads
6.	IS : 1161	1998	Steel tubes for structural purpose specification
7.	IS : 1364 (Part 1-3,5-6) part 4	2002 2003	Hexagon head Bolts, screw and Nuts of product Grades A &B
8.	IS : 1786	1985	Specification for high Strength Deformed steel Bars and wires for Concrete Reinforcement
9.	IS : 2074	1992	Ready Mixed Paint, Air Drying , Red Oxide Zinc Chrome, Printing- specification
10.	IS : 2062 IS : 808	1999 1989	Steel for General structural purposes- specification Dimensions for Hot Rolled steel Beam, Column, Channel and Angle Sections
11.	IS : 2502	1963	Code of practice for General structural Purposes- specification
12.	IS : 2932	1993	Enamel, synthetic, Exterior⊗a) Undercoating (b) Finishing – specification
13.	IS : 2933	1975	Enamel exterior (a) undercoating,(b) finishing
14.	IS : 3063	1994	Fasteners- single coil rectangle section spring lock washers- specification
15.	IS : 4759	1996	Specification for Hot –Dip Zinc Coating on structural steel and Other allied products
16.	IS : 6610 IS : 6639 IS: 1367	1972 2005 2002	Specification for Heavy washers for steel structures Specification of Hexagon Bolts for steel structures Technical supply Condition for Threaded steel fasteners (Third Revision) (part 8).
17.	IS : 12843	1989	Tolerances for erection of steel structures
18.	IS : 13229	1991	Zinc for galvanizing
19.	IS : 9595	1996	Metal are welding of carbon and carbon manages steel- Recommendations

PART –I

1.0 Scope: This document contains the generic requirements of 40.30 and 20 meter towers for Cellular systems. The tower shall be four legged and able to support antennas as given below:

- (I) The 40 and 30m tower shall be able to support the loading of the antennas as given below:
 - (a) 6 Nos. of panel antenna for WLL systems at top platform;
 - (b) 3 Nos. of 0.6 dia microwave solid dish antennas at a platform 6m below the top platform;
 - (c) 6 nos. of panel antennas for GSM systems at 9.5m below the top platform.
- (II) The 20 m tower shall be able to support the loading of the antenna as given below:
 - (a) 6 Nos o panel antennas for GSM/WLL systems at top platform
 - (b) Nos. of 0.6m dia microwave solid dish antenna at a platform 5m below top platform

The tower design is considered to be safe in all seismic zones (2 to5) with the condition that cyclone and earthquake do not occur simultaneously.

PART 2

2.0 FUNCTION AND TECHNICAL REQUIRMENTS:

2.1 Type of tower : four legged, square base tower with angular construction. The square top will be of 1300 mm sides and the square base as given below:

Tower	Base
40m	→ 4500mm
30m	→ 3498mm
20m	→ 2560mm

2.2 Height of towers : 40,30 and 20 meters. The 40 m tower consists of 11 panels and it shall be truncated from the bottom to get 30m and 20 m towers.

2.3 Foundation : The Raft type of foundation of the towers has been design basically for three types types of soils namely, hard /rocky, medium and soft.

These three types of soils in dry conditions have safe bearing capacity as 200 KN/m²(min) for hard /rocky soil,100 KN/m²(min) for medium soil and 60 KN/m²(min) for soft.

Non-galvanizing steel structure such as Anchor bolts etc, should be painted with red oxide coating The base plates should be galvanized as some portion of them may be directly exposed to environment.

The foundation design/drawings for tower given in the GR, may be considered for reference and actual foundation design/drawings may be as per the actual site requirements.

Material : M20 concrete shall be used. High strength Deformed steel bars of grade Fe415 conforming to IS: 1786(1985) shall be used. Bending of bars shall be as per IS: 2502(1963). Guards against corrosion & soil testing is a must before foundation is cast.

Foundation material is not in the scope of the tower supplier.

2.4 super structure:

2.4.1 Legs /Bracings

Material : angular Tower: MS angles of grade 'A' as per IS: 2062 (1999 and IS: 808 (1989).

Finish : All MS angles are not to be hot dip galvanized as per IS: 4759(1996).

Zinc for galvanishing should conform to IS : 1322(1991) or IS : 209(1992).

2.4.2 Gusset/splice plates

Material : MS plates of grade 'A' as per IS: 2062 (1999) shall be used.

Finish : All the plates are to be hot dip galavanising as per

IS: 4759(1999).

Standard Zinc for galvanizing should conform to IS: 132298(1991) or IS: 209(1992).

2.4.3 Nuts, Bolts & Washers

Material : Nuts bolts of Grade 5.6 part 8(1192) and plain washers as per IS: 6610(1972) & spring washers of type 'B' as per IS: 3063(1194) shall be used.

Finish : Nuts,Bolts and Washers are to be hot dip galvanized as per IS: 1367.

2.5 Connection between : vertical legs and bracings shall be connected to each other at site by gusset/splice plates with nuts, bolts and washers as per design. The design of tower members and joints is in accordance with the relevant provision in BPS document IS:800(1984).

3.0 Arrangement for feeder cable rack : Rack of running feeder cables from the rear of the antenna to the base of the tower shall be provided suitable supports shall be provided for all the feeder cable runs at 600mm each . width of each rack shall be 550mm.

4.0 Ladder : A ladder shall be provided externally for the entire height of the tower. Hoops and runners shall be provided to ensure the safety of the persons climbing the tower. Ladder width shall be 450 mm .The dia of safety hoops shall be 750mm.

5.0 platform : Working platform shall be provided at the different levels for panel and microwave antennas.

The platform details are given in Annex-1.

6.0 Wind velocity : Tower shall be operational and able to withstand the wind velocity corresponding to wind Zone 55m/s (200Km/hr) of IS: 875 (part3)1987 with survivability wind velocity of 210Km/hr for short duration suitable allowance have been made for antennas, ladder, platform wave guide/feeder cables and maintenance persons (up to three).

7.0 Lighting Arrestor : Lighting arrestor at the top of the tower [lighting rod made of copper, with 12 mm dia and 600 mm length as per IS: 613(2000) with a spike on one end and threading on the other shall be provided on the top of the tower. Tin coated copper from lower end of the lighting rod to the lug with a hole provided at 0.5m below the top of the tower

8.0 Aviation Warning : Fixing arrangement for twin type aviation warning light on diagonally opposite sides at the top level will be provided. (Screened PVC insulated twin copper wire of size 3/22 IS mark with PVC conduit pipe IS mark to be provided by installer)

9.0 Antenna mounting : Microwave antenna mounting pipe as per IS : 1161 shall be of 100NB (114.3 mm) outer dia,) 4.5 mm thickness and medium grade and 1.15 m in length with provision of mounting on the slat as well as straight portion of the tower Component details are given in the BOM.

For GSM antennas –GI pipes as per IS: 1161 of n80 NB (88.9mm outer diameter, 4.05 mm thickness and medium grade) and 1.5 meter length shall be provided. Component details are given in the BOM.
For CDMA antenna mounting : GI Pipe as per IS: 1161 of 100NB (114.3 mm outer dia), 4.5 mm

thickness and medium grade and 1.5 m length.
Components details are given in the BOM.

10.0 Verticality : The verticality of towers shall be within the limits as given in IS 1284:1989, Table : iii (b) (i)(i.e. the bottom of the line joining the centre of the top the tower and the centre of the base of the tower should be within the limits as given below. This may be checked in the field after the erection of the tower at site).

The limits for different tower height are as given below.

Tower	Verticality limits
40m →	4500mm
30m →	3498mm
20m →	2560mm

11.0 Earthing : For earthing of the tower, 50x3 GI strips should be bonded to the tower legs at the termination of the gusset plate of first joint and connected to ring earth at the other end. Ring earthing material shall be not be in the scope of the tower suppliers, (The maximum value of earthing resistance shall be 2 ohm. For more details, please refer to BSNL T&D circle E.I No. 1-001 on protection Earthing).

12.0 Welding : Welding if any, shall be done as per IS: 9595 (1996) and test for quality of welding will be carried as prescribed in the test schedule/test procedure. Welding connection of base plate are as per IS 800: 1984.

13.0 Marking : Manufacturing's identity marking and item marking shall be provided on each section by punching & planning for enabling easy assembly and trace – ability.
Smaller elements, on which complete marking details are not practicable, shall be supplied in suitable packing boxes and each box shall bear clear marking details such as name of site. Height

of tower and other details as given in the above para . However part No./item No. shall be marked on all tower elements.

The tower Supplied shall also provide the tower components manufacturer's identity/source.

A place indicating the manufacturer's identity/year of manufacturer the maximum load capacity of the tower shall be supplied by the manufacturer for display at the bottom of the tower.

- 14.0 Painting :
- The tower shall be coloured with alternate bands of orange & white or red & white paint as per ICAO recommendations. The Ready mixed paint, primer, Enamel etc. used for tower painting, may be as per the following IS codes:
- (i) Is 2074(1992): Ready Mixed paint Air Drying Red Oxide Zinc Chrome priming-specification;
 - (ii) Is 2932(1993): Enamel, synthetic Exterior:
(a) Undercoating (b) Finishing – specification
 - (iii) IS 2933(1975): Enamel exterior (a) undercoating,(b) finishing;
- The tower painting shall be done after tower erection.

- 15.0 Documentation :
- Two copies of complete documents with installation details in English/Hindi shall be supplied by the supplier.

- 16.0 Weight of tower** : **40m Tower**
(Tolerance in weight : ± 3%)
- (i) Weight of tower , inclusive of all parts of superstructure (excluding the weight of antenna mounting arrangement as mentioned below) as well as foundation (including base plate, anchor bolts but excluding RCC) : 9878 Kg.
(ii) Wt. of CDMA , Microwave & GSM antenna mounting arrangement : 670 Kg.
- 30 m Tower**
- (i)Weight of tower , inclusive of all parts of superstructure (excluding the weight of antenna mounting arrangement as mentioned below) as well as foundation (including base plate, anchor bolts but excluding RCC) : 6610 Kg.
- (ii) Wt. of CDMA , Microwave & GSM antenna mounting arrangement : 670 Kg.
- 20 mTower**
- (i)Weight of tower , inclusive of all parts of superstructure (excluding the weight of antenna mounting arrangement as mentioned below) as well as foundation (including base plate, anchor bolts but excluding RCC) : 3848 Kg.
- (ii) Wt. of CDMA , Microwave & GSM antenna mounting arrangement :481 Kg
- 17.0 Bill of material** : The Bill of material for the tower is at Appendix I to Appendix III
- 18.0 Design** : The detailed drawing of the tower is at Appendix IV and the enclosed as under :-
- 40/30/20 meter tower**
- i) Design drawing for reference
 - ii) Fabrication detail-I (panel detail 1-4)

- iii) Fabrication details - II (panel details 5-7)
- iv) Fabrication details - III (panel details 8-9)
- v) Fabrication details - IV (panel details 10-11)
- vi) Fabrication details -V (Ladder)
- vii) Fabrication details - VI (Cable Rack)
- viii) Fabrication details for 40 m (Net SBC 10 T/sq. m)
- ix) Fabrication details for 30 m (Net SBC 10 T/sq. m)
- x) Fabrication details for 20 m (Net SBC 10 T/sq. m)
- xi) Fabrication details for 40 m (Net SBC 20 T/sq. m)
- xii) Fabrication details for 30 m (Net SBC 20 T/sq. m)
- xiii) Fabrication details for 20 m (Net SBC 20 T/sq. m)
- xiv) Fabrication details for 40 m (Net SBC 6 T/sqm)
- xv) Fabrication details for 30 m (Net SBC 6 T/sqm)
- xvi) Fabrication details for 20 m (Net SBC 6 T/sqm)
- xvii) Template detail 40m level
- xviii) Template detail 30m level
- xix) Template detail 20m level
- xx) Mount for 0.6 m dia MW antenna (straight portion)
- xxi) Mount for 0.6 m dia MW antenna (Slant portion)
- xxii) GSM antenna mount
- xxiii) GSM antenna mount (Component detail 1)
- xxiv) GSM antenna mount (Component detail 2)
- xxv) CDMA antenna mount
- xxvi) Aviation lamp pad

Notes:

- (1) All the major component of material for tower shall be procured from the approved sources and certificate to this affect shall be given by manufacturer.
- (2) All the responsibility for tower erection shall lie with the erection agency which would followed safety norms as per IS 7205 (1974)
- (3) At the time of publication, the editions of IS standards indicated were valid . Is standards are subject to revision and the most recent edition of the standards indicated in this GR shall be applicable.
- (4) All unspecified holes in tower members are 17.5 mm dia for 16mm bolts conforming to class 5.6.All unspecified plates 6 mm thick. All unspecified members are L 45x45x5-1 SS.
- (5) Structural steel shall conform to IS 2062 Grade –A with minimum yields stress of 250 Kg/sq cm.
- (6) Spring washers are to be under each nut.
- (7) a) Tower accessories include lighting protection system, grounding system, ladder vertical feeder support, antenna mounting structures, working platform (t the

location of antennas) and rest platform at 20m from base. The top most working platform has been considered as external platform & remaining working platform shall be internal.

b) Angular rotation is less than 0.5 and twist is less 0.5.

c) Limiting slenderness ration for the members considered is:

Leg members	120
Other members	200
Redundant members	250

d) Minimum thickness of the member considered is :

Leg members	5 mm
Lattices/ Belts	5 mm
Redundant members	5 mm

For easy access to the rear of antenna, platform to be provided as given below:

Sr. No.	Tower Height	Platform position	Remarks
1	40 Meter	a) 37.5 meter (external) b) 28.0 meter (internal) c) 32.5 meter (internal)	For panel antennas For solid Dish antennas.
2	30 meter	a) 27.5 meter (external) b) 18.0 meter (internal) c) 22.5 meter (internal)	For panel antennas For solid Dish antennas.
3	20 meter	a) 17.5 meter (external) b) 12.5 meter (internal)	For panel antennas For solid Dish antennas.

Annex for the reference of the purchaser

The following clause are for the reference of the purchaser only and clause shall not be tested during Type Approval testing

1. The number of antenna fixture required shall be clearly mentioned at the time of ordering.
2. Details of the antenna Fixtures/Mounts, given in the GR , are for reference only and purchaser may specify the details of /mount /Fixture at the time placing of purchaser order as per their needs. Further, if the actual site requirement is not decided at the time of placing purchase Order, the tower may be ordered without antenna Fixtures.

ABBREVIATIONS

BIS	Bureau of Indian standards
BOM	Bill of Materials
B/B	Back to Back
C/C	Centre to center
CDMA	Code Division Multiple Access
CHQD.PL.	Chequered plate
DIA	Diameter
DIAG	Diagonal
EI	Engineering Instruction
EL.	Elevation
FL.	Flat (Mild steel)
GI	Galvanised Iron
GR	Generic Requirement
GSM	Global system for Mobile Communications
HEX	Hexagonal
HORIZ	Horizontal
ICAO	International Civil Aviation Organisation
IS	Indian standards
BIS	Bureau of standards
ISA	Indian standards Angles of mild steel
Kg	Kilogram
Km/hr	Kilometer per Hour
KN/m ²	Kilo Newton per Meter Square Meter
M	Meter
Mm	Milimeter
m/s	Meter per second
MS	Mild steel
M20	Code of Concrete
NB	Nominal Bore
PL	Plate (Mild steel)
P.C.C	Plane Cement Concrete
PF	platform
REF	reference
R.C.C	Re-Inforced Cement Concrete
R.P	Rest Platform
SBC	Safe Bearing Capacity
SEG	Segment
SERC	Structural Engineering Research Centre
SPL	Splice plate
TEC	Telecom Engineering Centre
THK	Thickness
VER	Vertical

YST	Yeild strength
WLL	Wireless in Local Loop
W.P.	Working platform
WT	weight
X-BREACING	Cross Bracing

COOMPONENT OF PENAL & 11 FOR 40 M NARROW BASE OWER										TYPE- 40 -IIT
REF. DEG. NO. - FEBRICATION DETAIL-4										
MEMBER NO.	SECTION						LENGTH	UNIT WT.	QUAN-TITY	TOTAL WEIGHT
		(mm)		(mm)		(mm)	(M)	(KG/M	(Nos.)	(Kg.)
11L	ISA	150	X	150	X	16	4.997	35.80	4	715.57
11D-1	ISA	75	x	75	x	6	4.103	6.80	8	223.20
11D-2	ISA	75	X	75	X	6	2.497	6.80	8	135.84
11H	ISA	60	x	60	x	6	2.159	5.40	6	69.95
11H-1	ISA	60	X	60	X	6	2.159	5.40	2	23.32
11B-1	ISA	45	X	45	X	5	1.105	3.40	16	60.11
11B-2	ISA	45	X	45	X	5	1.63	3.40	8	43.60
11B-3	ISA	45	x	45	x	5	1.611	3.40	8	49.82
11PB	ISA	65	x	65	x	6	2.959	5.80	2	34.32
11PB-1	ISA	65	x	65	x	6	2.959	5.80	1	17.16
11PB-2	ISA	65	X	65	X	6	2.959	5.80	1	17.16
10L	ISA	150	X	150	X	12	5.007	27.20	4	544.76
10D-1	ISA	75	X	75	X	5	3.795	5.70	8	173.05
10D-2	ISA	75	X	75	X	5	2.497	5.70	8	113.86
10H	ISA	50	X	50	X	5	1.911	3.80	6	43.57
10H-1	ISA	50	x	50	x	5	1.911	3.80	2	14.52
10B-1	ISA	45	X	45	X	5	0.981	3.40	16	53.37
10B-2	ISA	45	X	45	X	5	1.555	3.40	8	42.30
10B-3	ISA	45	X	45	X	5	1.518	3.40	8	41.29
10PB	ISA	60	X	60	X	6	2.611	5.40	2	28.20
10PB-1	ISA	60	X	60	X	6	2.611	5.40	1	14.10
10PB-2	ISA	60	X	60	X	6	2.611	5.40	1	14.10
11CR-1	ISA	45	X	45	X	5	0.279	3.40	1	0.95
11CR-2	ISA	45	X	45	X	5	0.360	3.40	1	1.22
11CL-1	ISA	45	X	45	X	5	0.406	3.40	1	1.38
11CL-2	ISA	45	X	45	X	5	0.329	3.40	1	1.12
10CR-1	ISA	45	X	45	X	5	0.293	3.40	1	1.00
10CR-2	ISA	45	X	45	X	5	0.355	3.40	1	1.21
10CL-1	ISA	45	X	45	X	5	0.393	3.40	1	1.34
10CL-2	ISA	45	X	45	X	5	0.337	3.40	1	1.15
SL-1	ISA	130	X	130	X	12	0.570	23.40	4	53.35
CP-1	ISA	115	X	10	X		0.570	9.03	8	41.17
SL-2	ISA	130	X	130	X	12	0.570	23.40	4	53.35
CP-2	ISA	115	X	8	X		0.570	7.22	8	32.93
PP-2	ISA	115	X	2	X		0.280	1.81	8	4.04
SL-4	ISA	60	X	60	X	5	0.226	4.50	8	8.14
CP-4	ISA	50	X	6	X		0.186	2.36	16	7.01
SL3	ISA	60	X	60	X	6	0.222	4.50	8	8.14
CP3	ISA	50	X	6	X		0.186	2.36	16	7.01
									TOTAL=	2691.67

COOMPONENT OF PENAL 8& 9 FOR 40 M NARROW BASE OWER										TYPE- 40 -IIT
REF. DEG. NO.- FEBRICATION DETAIL-3										
MEMBER NO.		SECTION					LENGTH (M)	UNIT WT. (KG/M)	QUAN-TITY (Nos.)	TOTAL WEIGHT (Kg.)
		(mm)		(mm)		(mm)				
9L	ISA	130	X	130	X	12	5.006	23.40	4	468.56
9D-1	ISA	75	x	75	x	5	3.516	5.70	8	160.33
9D-2	ISA	75	X	75	X	5	2.497	5.70	8	113.86
9H	ISA	50	x	50	x	5	1.668	3.80	6	38.03
9H-1	ISA	50	X	50	X	5	0.862	3.80	2	12.83
9B-1	ISA	45	X	45	X	5	1.494	3.40	8	23.45
9B-2	ISA	45	X	45	X	5	1.435	3.40	8	40.64
9B-3	ISA	45	x	45	x	5	1.435	3.40	8	39.03
9B-4	ISA	45	x	45	x	5	0.859	3.40	8	23.36
9PB	ISA	50	x	50	x	5	2.260	3.80	2	17.16
9PB-1	ISA	50	X	50	X	5	2.260	3.80	1	8.59
9PB-2	ISA	50	X	50	X	5	2.260	3.80	1	8.59
8L	ISA	130	X	130	X	10	5.006	19.70	4	394.47
8D	ISA	65	X	65	X	6	5.767	5.80	8	267.59
8H	ISA	45	X	45	X	5	1.420	3.40	6	28.97
8H-1	ISA	45	x	45	x	5	1.420	3.40	2	9.66
8B-1	ISA	45	X	45	X	5	0.735	3.40	8	19.99
8B-2	ISA	45	X	45	X	5	1.437	3.40	8	39.09
8B-3	ISA	45	X	45	X	5	1.341	3.40	8	36.48
8B-4	ISA	45	X	45	X	5	0.735	3.40	8	19.99
8PB	ISA	45	X	45	X	5	1.910	3.40	2	12.99
8PB-1	ISA	45	X	45	X	5	1.910	3.40	1	6.49
8PB-2	ISA	45	X	45	X	5	1.910	3.40	1	6.49
9CR-1	ISA	45	X	45	X	5	0.293	3.40	1	1.00
9CR-2	ISA	45	X	45	X	5	0.355	3.40	1	1.21
9CL-1	ISA	45	X	45	X	5	0.392	3.40	1	1.33
9CL-2	ISA	45	X	45	X	5	0.337	3.40	1	1.15
8CR-1	ISA	45	X	45	X	5	0.297	3.40	1	1.01
8CR-2	ISA	45	X	45	X	5	0.353	3.40	1	1.20
8CL-1	ISA	45	X	45	X	5	0.388	3.40	1	1.32
8CL-2	ISA	45	X	45	X	5	0.340	3.40	1	1.16
SL-5	ISA	130	X	130	X	12	0.440	23.40	4	41.18
CP-5	PL.	105	X	8	X		0.440	6.59	8	23.21
SL-6	ISA	110	X	110	X	10	0.440	16.50	4	29.04
CP-6	PL.	105	X	8	X		0.440	6.59	8	23.21
PP-6	PL.	115	X	2	X		0.215	1.81	8	3.11
SL-7	ISA	110	X	110	X	10	0.330	16.50	4	21.78
CP-7	PL.	90	X	8	X		0.293	5.65	8	13.25
SL-8	ISA	60	X	60	X	6	0.226	5.40	8	9.76
CP-8	PL.	50	X	6	X		0.196	2.36	16	7.39
									TOTAL	1977.95

COOMPONENT OF PENAL 07 FOR 40 M NARROW BASE OWER										TYPE- 40 -IIT	
REF. DEG. NO.- FEBRICATION DETAIL-2											
MEMBER NO.	SECTION	SECTION					LENGTH (M)	UNIT WT. (KG/M)	QUAN-TITY (Nos.)	TOTAL WEIGHT (Kg.)	
		(mm)		(mm)		(mm)					
7L	ISA	110	X	110	X	10	3.504	16.50	4	231.26	
7D	ISA	50	x	50	x	6	4.262	4.50	8	153.43	
7H	ISA	45	X	45	X	5	1.199	3.40	6	24.46	
7H-1	ISA	45	x	45	x	5	1.199	3.40	2	8.15	
7B-1	ISA	45	X	45	X	5	0.617	3.40	8	16.78	
7B-2	ISA	45	X	45	X	5	1.032	3.40	8	28.07	
7B-3	ISA	45	X	45	X	5	0.998	3.40	8	27.15	
7PB	ISA	45	x	45	x	5	1.619	3.40	2	11.01	
7PB-2	ISA	45	x	45	x	5	1.619	3.40	1	5.50	
7CR-1	ISA	45	x	45	x	5	0.353	3.40	1	5.50	
7CR-2	ISA	45	X	45	X	5	0.297	3.40	1	1.20	
7CL-1	ISA	45	X	45	X	5	0.341	3.40	1	1.01	
7CL-2	ISA	45	X	45	X	5	0.387	3.40	1	1.16	
6L	ISA	100	X	45	X	8	3.004	12.10	1	145.39	
6D	ISA	50	X	100	X	6	3.662	4.50	4	131.83	
6H	ISA	45	x	50	x	5	1.045	3.40	8	21.32	
6H-1	ISA	45	X	45	X	5	1.045	3.40	6	7.11	
6B-1	ISA	45	X	45	X	5	0.545	3.40	2	14.82	
6B-2	ISA	45	X	45	X	5	0.835	3.40	8	22.71	
6PB	ISA	45	X	45	X	5	1.395	3.40	8	9.49	
6PB-1	ISA	45	X	45	X	5	1.395	3.40	2	4.74	
6PB-2	ISA	45	X	45	X	5	1.395	3.40	1	4.74	
6CR-1	ISA	45	X	45	X	5	0.353	3.40	1	1.20	
6CR-2	ISA	45	X	45	X	5	0.299	3.40	1	1.02	
6CL-1	ISA	45	X	45	X	5	0.342	3.40	1	1.16	
6CL-2	ISA	45	X	45	X	5	0.384	3.40	1	1.31	
5L	ISA	90	X	45	X	8	3.004	10.80	1	129.77	
5D	ISA	50	X	45	X	6	3.508	4.50	4	126.29	
5H-1	ISA	55	X	45	X	6	1.762	4.90	8	8.63	
5H-2	ISA	55	X	90	X	6	1.762	4.90	1	8.63	
5H-3	ISA	45	X	50	X	6	2.607	4.90	1	12.77	
5H-4	ISA	45	X	55	X	6	2.607	4.90	1	12.77	
5B-1	ISA	45	X	55	X	5	0.483	3.40	1	13.14	
5B-2	ISA	45	X	55	X	5	0.848	3.40	8	23.07	
5CR-1	ISA	45	X	55	X	5	1.129	3.40	8	3.84	
5CR-2	ISA	45	X	45	X	5	1.129	3.40	1	3.84	
5CL-1	ISA	45	X	45	X	5	0.329	3.40	1	1.12	
5CL-2	ISA	45	X	45	X	5	0.329	3.40	1	1.12	
SL-7	ISA	100	X	100	X	8	0.330	12.10	1	15.97	
CP-7	ISA	50	X	8	X		0.330	3.14	8	8.29	
SL-9	PL.	90	X	90	X	8	0.330	10.80	4	14.26	
CP-9	ISA	85	X	6	X		0.330	4.00	8	10.57	
PP-9	PL.	85	X	2	X		0.160	1.33	8	1.71	
SL-10	PL.	75	X	75	X	6	0.260	6.80	4	7.07	
CP-10	ISA	50	X	6	X		0.235	2.36	8	4.443	
SL-11	ISA	65	X	65	X	6	0.260	5.80	4	6.03	
CP-11	PL.	50	X	6	X		0.235	2.36	8	4.43	
PP-11	PL.	65	X	2	X		0.100	1.02	8	0.82	
5G	PL.	110	X	6	X		0.282	5.18	8	11.69	
6G	PL.	112	X	6	X		0.254	5.28	8	10.72	
TOTAL									1323.83		

COOMPONENT OF PENAL 04 FOR 40 M NARROW BASE OWER										TYPE- 40 -IIT
REF. DEG. NO.- FEBRICATION DETAIL-1										
MEMBER NO.		SECTION					LENGTH	UNIT WT.	QUAN- TITY	TOTAL WEIGHT
		(mm)		(mm)		(mm)				
4L	ISA	75	X	75	X	6	3.004	6.80	4	81.71
4D	ISA	50	x	50	x	5	3.311	3.80	8	100.65
4H	ISA	45	X	45	X	5	0.769	3.40	6	15.69
4H-1	ISA	45	x	45	x	5	0.769	3.40	2	5.23
4B-1	ISA	45	X	45	X	5	0.415	3.40	8	11.29
4B-2	ISA	45	X	45	X	5	0.799	3.40	8	21.73
4CR-1	ISA	45	X	45	X	5	0.353	3.40	1	1.20
4CR-2	ISA	45	x	45	x	5	0.302	3.40	1	1.03
4CL-1	ISA	45	x	45	x	5	0.234	3.40	1	0.80
4CL-2	ISA	45	x	45	x	5	0.286	3.40	1	0.97
3L	ISA	75	X	75	X	5	3.004	5.70	4	68.49
3D	ISA	45	X	45	X	5	2.727	3.40	8	74.17
3CR-1	ISA	45	X	45	X	5	1.129	3.40	1	3.84
3CR-2	ISA	45	X	45	X	5	1.129	3.40	1	3.84
3CL-1	ISA	45	X	45	X	5	0.329	3.40	1	1.12
3CL-2	ISA	45	x	45	x	5	0.329	3.40	1	1.12
2L	ISA	75	X	75	X	5	4.595	5.70	4	104.77
2D	ISA	45	X	45	X	5	2.727	3.40	8	74.17
2H	ISA	45	X	45	X	5	0.700	3.40	18	14.28
2H-1	ISA	45	X	45	X	5	0.700	3.40	6	42.84
2CR-1	ISA	45	X	45	X	5	0.353	3.40	2	2.40
2CR-2	ISA	45	X	45	X	5	0.302	3.40	2	2.05
2CL-1	ISA	45	X	45	X	5	0.346	3.40	2	2.35
2CL-2	ISA	45	X	45	X	5	0.387	3.40	2	2.63
2PB	ISA	45	X	45	X	5	0.881	3.40	2	5.99
2PB-1	ISA	45	X	45	X	5	0.881	3.40	1	3.00
2PB-2	ISA	45	X	45	X	5	0.881	3.40	1	3.00
1D	ISA	45	X	45	X	5	2.727	3.40	8	74.17
1H	ISA	45	X	45	X	5	1.350	3.40	3	13.77
1H-1	ISA	45	X	45	X	5	1.350	3.40	1	4.59
1CR-1	ISA	45	X	45	X	5	0.360	3.40	1	1.22
1CR-2	ISA	45	X	45	X	5	0.360	3.40	1	1.22
1CL-1	ISA	45	X	45	X	5	0.329	3.40	1	1.12
1CL-2	ISA	45	X	45	X	5	0.329	3.40	1	1.12
1PB	ISA	45	X	45	X	5	0.917	3.40	2	6.24
1PB-1	ISA	45	X	45	X	5	0.917	3.40	1	3.12
1PB-2	ISA	45	X	45	X	5	0.917	5.70	1	3.12
1CR-1A	ISA	45	X	45	X	5	0.353	3.40	1	1.20
1CR-2A	ISA	45	X	45	X	5	0.353	3.40	1	1.14
1CL-1A	ISA	45	X	45	X	5	0.336	3.40	1	1.14
1CL-2A	ISA	45	X	45	X	5	0.336	3.40	1	6.03
SL-11	ISA	65	X	65	X	6	0.260	5.80	4	4.43
CP-11	PL.	50	X	6	X		0.235	2.36	8	0.63
PP-11	PL.	50	X	2	X		0.100	0.79	8	6.03
SL-12	ISA	65	X	65	X	6	0.260	5.80	4	4.43
CP-12	PL.	50	X	6	X		0.235	2.36	8	0.63
SL-13	ISA	65	X	65	X	6	0.260	5.80	4	6.03
CP-13	PL.	50	X	6	X		0.235	2.36	8	4.43
CP-14	PL.	50	X	6	X		0.181	2.36	2	0.85
LT-A	ISA	75	X	75	X	5	0.438	5.70	1	2.50
LT-B	PL.	50	X	6	X		0.150	2.36	1	0.35
									TOTAL	800.44

(40 M HIGH TOWER, DETAIL OF PLATFORM)											TYPE- 40 -IIT	
MEMBER NO.	SECTION						LENG TH	UNIT WT.	QUAN- TITY	TOTAL WEIGHT		
	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)					(M)	(KG/M)
PLATFORM FOR GSM ANTENNA LVL 12 M FROM TOP												
5PF-1	PL.	45	X	5	X		1.688	1.77	3	8.94		
5PF-2	ISA	60	x	60	x	5	0.100	4.50	10	4.50		
5PF-3	ISA	55	X	55	X	6	1.923	4.90	1	9.42		
5PF-4	ISA	45	x	45	x	5	1.233	3.40	2	8.38		
5PF-5	ISA	45	X	45	X	5	1.399	3.40	2	9.51		
5PF-6	ISA	45	X	45	X	5	1.233	3.40	1	4.19		
5PF-7	ISA	45	X	45	X	5	1.233	3.40	1	4.19		
5PF-8	ISA	45	x	45	x	5	1.080	3.40	2	7.34		
5PF-9	PL.	110	x	6	x		0.100	5.18	2	1.04		
5PF-10	PL.	45	x	5	x		0.985	1.77	2	3.48		
5PF-11	ISA	55	X	55	X	5	1.010	4.10	2	8.28		
5PF-12	ISA	55	X	55	X	5	1.843	4.10	1	7.56		
5PF-13	PL.	45	X	5	X		1.843	1.77	1	3.26		
5PF-14	ISA	55	X	55	X	5	1.843	4.10	1	7.56		
CHQD. PLATE												
5CH-1	PL.	1399	x	5	x		1.399	54.91	1	76.82		
5CH-2	PL.	922	X	5	X		0.922	36.19	2	33.37		
5CH-3	PL.	632	X	5	X		0.866	24.81	1	21.48		
5CH-3A	PL.	632	X	5	X		0.866	24.81	1	21.48		
5CH-4	PL.	676	X	5	X		0.765	26.53	1	20.30		
5CH-4A	PL.	676	X	5	X		0.765	26.53	1	20.30		
PLATFORM FOR 0.6 M DIA ANTENNA LVL 7.5 M FROM TOP												
3PF-1	ISA	55	X	55	X	6	1.350	4.90	1	6.62		
3PF-2	PL.	45	X	5	X		0.800	1.77	3	4.24		
3PF-3	PL.	45	X	5	X		1.350	1.77	3	7.15		
3PF-4	ISA	55	X	55	X	6	1.350	4.90	1	6.62		
3PF-5	ISA	55	X	55	X	6	2.165	4.90	1	10.61		
3PF-6	ISA	55	X	55	X	6	2.165	4.90	1	10.61		
3PF-7	ISA	55	X	55	X	6	1.490	4.90	1	7.30		
3PF-8	ISA	60	X	60	X	5	0.100	4.50	9	4.05		
3PF-9	ISA	45	X	45	X	5	0.927	3.40	2	6.30		
3PF-10	ISA	60	X	60	X	5	1.094	4.50	2	9.85		
3PF-11	ISA	45	X	45	X	5	0.927	3.40	1	3.15		
3PF-12	ISA	45	X	45	X	5	0.927	3.40	1	3.15		
3PF-13	ISA	55	X	55	X	5	0.949	4.10	2	7.78		
3PF-14	PL.	110	X	6	X		0.100	5.18	4	2.07		
3PF-15	PL.	45	X	5	X		0.949	1.77	2	3.35		
3PF-16	ISA	45	X	45	X	5	1.080	3.40	1	3.67		
3PF-17	ISA	55	X	55	X	5	1.410	4.10	1	5.78		
3PF-18	FL	45	X	5			1.410	1.77	1	2.49		
CHQD. PLATE												
3CH-1	PL.	1094	X	5			1.094	42.94	1	46.98		
3CH-2	PL.	703	X	5			0.703	27.59	2	19.40		
3CH-3	PL.	416	X	5			0.670	16.33	1	10.94		
3CH-3A	PL.	416	X	5			0.670	16.33	1	10.94		
3CH-4	PL.	460	X	5			0.765	18.06	1	13.81		
3CH-4A	PL.	460	X	5			0.765	18.06	1	13.81		

Appendix I

(40 M HIGH TOWER, DETAIL OF PLATFORM)								TYPE- 40 -IIT		
MEMBER NO.		SECTION					LENGTH	UNIT WT.	QUAN- TITY	TOTAL WEIGHT
		(mm)		(mm)		(mm)				
PLATFORM FOR GSM ANTENNA LVL 125 M FROM TOP										
1PF-1	PL.	55	X	55	X	5	1.027	4.10	8	33.69
1PF-2	ISA	100	x	100	x	8	0.150	12.10	8	14.52
1PF-3	ISA	55	X	55	X	5	2.972	4.10	1	12.19
1PF-4	ISA	45	x	45	x	5	0.796	3.40	3	8.12
1PF-5	ISA	55	X	55	X	5	2.972	4.10	4	12.19
1PF-6	ISA	55	X	55	X	5	1.105	4.10	2	18.12
1PF-7	ISA	45	X	45	X	5	0.920	3.40	1	6.26
1PF-8	ISA	45	x	45	x	5	0.920	3.40	1	3.13
1PF-9	ISA	45	x	45	x	5	0.920	3.40	2	3.13
1PF-10	ISA	45	x	45	x	5	0.796	3.40	2	5.41
1PF-11	ISA	55	X	55	X	5	1.360	4.10	2	11.51
1PF-12	ISA	55	X	55	X	5	0.796	4.10	2	6.53
1PF-13	PL.	55	X	55	X	5	0.796	4.10	2	6.53
1PF-14	ISA	55	X	55	X	5	1.480	4.10	4	2427
1PF-16	PL.	110	X	6	X		0.100	5.18	16	8.29
1PF-17	PL.	45	x	6	x		0.121	2.12	8	2.05
1PF-18	FL	45	X	5	X		1.089	1.77	4	7.69
1PF-19	ISA	45	x	45	x	5	1.089	3.40	4	14.81
1PF-20	ISA	45	X	45	X	5	1.085	3.40	4	14.76
1PF-21	ISA	45	X	45	X	5	1.085	3.40	4	14.76
1PF-22	FL	45	X	5	X		1.410	1.77	4	9.96
1PF-23	ISA	45	x	45	x	5	1.085	3.40	4	14.76
1PF-24	ISA	45	x	45	x	5	1.085	3.40	4	14.76
1PF-25	ISA	55	x	55	x	6	1.410	4.90	4	27.64
1PF-26	PL.	45	X	5	X		0.800	1.77	3	4.24
1PF-27	ISA	45	X	45	X	5	1.350	3.40	3	13.77
1PF-28	PL.	100	X	6	X		0.160	4.71	8	6.03
CHQD. PLATE										
1CH-1	PL.	1399	x	5	x		1.399	54.91	1	76.82
1CH-2	PL.	922	X	5	X		0.922	36.19	2	33.37
1CH-3	PL.	632	X	5	X		0.866	24.81	1	21.48
									TOATL	1017.91
(40 M HIGH TOWER , DETAIL OF LADDER, SHEET NO-6)								TYPE -40-IIT		
MEMB ER NO.		SECTION					LENGTH	UNIT WT.	QUAN- TITY	TOTAL WEIGHT
		(mm)		(mm)		(mm)				
LR										
BC	ISA	50	X	50	x	5	0.150	3.80	2	1.14
B	ISA	45	X	45	X	5	0.707	3.40	2	4.81
C	RUNG	16	DIA				0.458	1.60	3	2.20
11LR TO 6 LR										
B	ISA	45	X	45	X	5	4.994	3.40	12	203.76
C	RUNG	16	DIA				0.458	1.60	120	87.84
5LR										
B	ISA	45	X	45	x	5	4.995	3.40	2	33.97
C	RUNG	16	DIA				0.458	1.60	20	14.64
4LR										
B	ISA	45	X	45	X	5	4.556	3.40	2	30.98
C	RUNG	16	DIA				0.458	1.60	18	13.18
PF-1	PL.	40	X	5			2.207	1.57	3	10.39
PF-2	PL.	40	X	5			4.994	1.57	12	94.09
PF-3	PL.	40	X	5			1.837	1.57	3	8.65
PF-4	PL.	40	X	5			2.050	1.57	3	9.66
PF-5	PL.	40	X	5			3.050	1.57	3	14.37
PR	PL.	40	X	5			1.868	1.57	32	93.85
LC-1	PL.	40	X	6			0.186	1.88	32	11.21
LC-2	PL.	40	X	6			0.186	1.88	15	5.26
									TOTAL	639.98

(40 M HIGH TOWER , DETAIL OF CABLE RACK, SHEET NO-6)							TYPE -40-IIT			
MEMBER NO.		SECTION					LENGT H (M)	UNIT WT. (KG/M)	QUAN- TITY (Nos.)	TOTAL WEIGHT (Kg.)
		(mm)		(mm)		(mm)				
11CR										
A	PL.	50	X	5		2.725	1.96	2	10.70	
B	PL.	40	X	5		0.550	1.57	5	4.32	
10CR										
A	PL.	50	X	5		4.994	1.96	2	19.60	
B	PL.	40	X	5		0.550	1.57	8	6.91	
9LR										
A	PL.	50	X	5		4.994	1.96	2	19.60	
B	PL.	40	X	5		0.550	1.57	8	7.77	
8CR										
A	PL.	50	X	5		4.994	1.96	2	19.60	
B	PL.	40	X	5		0.550	1.57	8	6.91	
7CR										
A	PL.	50	X	5		4.994	1.96	2	19.60	
B	PL.	40	X	5		0.550	1.57	8	6.91	
6CR										
A	PL.	50	X	5		4.994	1.96	2	19.60	
B	PL.	40	X	5		0.550	1.57	9	7.77	
5CR										
A	PL.	50	X	5		4.994	1.96	2	19.60	
B	PL.	40	X	5		0.550	1.57	8	6.91	
4CR										
A	PL.	50	X	5		4.994	1.96	2	19.60	
B	PL.	40	X	5		0.550	1.57	8	6.91	
CL	PL.	40	X	5		0.146	1.57	14	3.21	
								TOTAL	205.52	
BASE PLATE FOR 40 M. TOWER							SHEET NO.4		TYPE -40-IIT	
MEMBER NO.		SECTION					LENGT H (M)	UNIT WT. (KG/M)	QUAN- TITY (Nos.)	TOTAL WEIGHT (Kg.)
		(mm)		(mm)		(mm)				
STB-40										
	PL.	400	X	40		0.400	125.60	4	200.96	
	PL.	300	X	10		0.143	23.55	8	26.94	
	PL.	300	X	10		0.087	23.55	8	16.39	
	PL.	300	X	10		0.186	25.55	4	17.52	
	PL.	100	X	150	X	16	0.598	35.80	4	85.63
								TOTAL	347.45	
LIGHTING ARRESTER PAD							SHEET NO.1		TYPE -40-IIT	
MEMBER NO.		SECTION					LENGT H (M)	UNIT WT. (KG/M)	QUAN- TITY (Nos.)	TOTAL WEIGHT (Kg.)
		(mm)		(mm)		(mm)				
LT										
A	ISA	75	X	75	X	5	0.438	5.70	1	2.50
B	PL.	50	X	6	X		0.150	2.36	1	0.35
								TOATL	2.85	
VIATION LAMP PAD							SHEET NO.1		TYPE -40-IIT	
MEMBER NO.		SECTION					LENGT H (M)	UNIT WT. (KG/M)	QUAN- TITY (Nos.)	TOTAL WEIGHT (Kg.)
		(mm)		(mm)		(mm)				
AV										
A	ISA	65	X	65	X	5	0.438	4.90	1	2.15
B	PL.	160	X	6			0.160	7.54	1	1.21
CP-14	PL.	50	X	6			0.181	2.36	2	0.85
								TOTAL	4.20	

DETAILS OF FOUNDATION BOLTS										
MEMBER NO.	SECTION					LENGTH	UNIT WT.	QUAN-TITY	TOTAL WEIGHT	
	(mm)	(mm)	(mm)	(mm)	(M)	(KG/M)	(Nos.)	(Kg.)		
1	36 DIA				0.9	8.800	32	253.44		
2	PL: 80 X 6				0.08	3.768	32	9.65		
SQ WASHER	PL: 80 X 6				0.08	3.768	32	9.65		
NUTS	36 DIA					0.500	64	32.00		
							TOTAL	304.73		
NUTS & BOLTS										
MEMBER NO.	DESCRIPTION OF MEMBER	SECTION				LENGTH	UNIT WEIGHT	QUANTITY	TOTAL WEIGHT	
		mm				(M)	(KG/M)	(Nos.)	(Kg.)	
1	NUTS & BOLTS	12 mm dia				0.030	0.058	160	9.20	
2	NUTS & BOLTS	12 mm dia				0.035	0.062	245	15.19	
3	NUTS & BOLTS	16 mm dia				0.035	0.125	195	24.38	
4	NUTS & BOLTS	16 mm dia				0.040	0.133	710	94.43	
5	NUTS & BOLTS	16 mm dia				0.045	0.144	695	98.00	
6	NUTS & BOLTS	16 mm dia				0.050	0.149	310	46.19	
7	NUTS & BOLTS	16 mm dia				0.050	0.157	120	18.84	
8	NUTS & BOLTS	16 mm dia				0.055	0.164	145	23.78	
9	NUTS & BOLTS	16 mm dia				0.060	0.172	190	32.68	
10	PACK WASHERS	PL.	35	X	5	X	0.035	1.37	105	5.05
11	PACK WASHERS	PL.	35	X	6	X	0.035	1.65	18	1.04
12	PACK WASHERS	PL.	35	X	8	X	0.035	2.20	24	1.85
13	PACK WASHERS	PL.	35	X	10	X	0.035	2.75	10	0.96
14	PACK WASHERS	PL.	35	X	12	X	0.035	3.30	10	1.15
15	PACK WASHERS	PL.	35	X	16	X	0.035	4.40	10	1.54
									TOTAL=	374.27
SUMMARY FOR 40 M NARROW BASE TOWER										
						WEIGHT	TYPE -40IIT			
WEIGHT OF PENE		10 & 11				=	2692			
WEIGHT OF PENE		8&9				=	1978			
WEIGHT OF PENE		5 TO 7				=	1324			
WEIGHT OF PENE		1 TO 4				=	800			
WEIGHT OF PLAT FORM						=	1018			
LADDER						=	640			
V.CABLE RACK						=	206			
LIGHTING ARRESTER						=	3			
AVIATION LAMP						=	4			
WEIGHT OF BASE PLATE						=	347			
FOUNDATION BOLTS						=	305			
C.D.M.A MOUNT						=	189			
0.6 M.W.MOUNT FRAME						=	133			
GSM MOUNT FRAME						=	348			
NUTS & BOLTS						=	374			
TEMPLATE						=	187			
TOTAL						10548	KG			

COOMPONENT OF PENAL 8& 9 FOR 40 M NARROW BASE OWER										TYPE- 40 -IIT
REF. DEG. NO.- FEBRICATION DETAIL-3										
MEMBER NO.	SECTION						LENGTH	UNIT WT.	QUAN-TITY	TOTAL WEIGHT
		(mm)		(mm)		(mm)	(M)	(KG/M	(Nos.)	(Kg.)
9L	ISA	130	X	130	X	12	5.006	23.40	4	468.56
9D-1	ISA	75	x	75	x	5	3.516	5.70	8	160.33
9D-2	ISA	75	X	75	X	5	2.497	5.70	8	113.86
9H	ISA	50	x	50	x	5	1.668	3.80	6	38.03
9H-1	ISA	50	X	50	X	5	0.862	3.80	2	12.83
9B-1	ISA	45	X	45	X	5	1.494	3.40	8	23.45
9B-2	ISA	45	X	45	X	5	1.435	3.40	8	40.64
9B-3	ISA	45	x	45	x	5	1.435	3.40	8	39.03
9B-4	ISA	45	x	45	x	5	0.859	3.40	8	23.36
9PB	ISA	50	x	50	x	5	2.260	3.80	2	17.16
9PB-1	ISA	50	X	50	X	5	2.260	3.80	1	8.59
9PB-2	ISA	50	X	50	X	5	2.260	3.80	1	8.59
8L	ISA	130	X	130	X	10	5.006	19.70	4	394.47
8D	ISA	65	X	65	X	6	5.767	5.80	8	267.59
8H	ISA	45	X	45	X	5	1.420	3.40	6	28.97
8H-1	ISA	45	x	45	x	5	1.420	3.40	2	9.66
8B-1	ISA	45	X	45	X	5	0.735	3.40	8	19.99
8B-2	ISA	45	X	45	X	5	1.437	3.40	8	39.09
8B-3	ISA	45	X	45	X	5	1.341	3.40	8	36.48
8B-4	ISA	45	X	45	X	5	0.735	3.40	8	19.99
8PB	ISA	45	X	45	X	5	1.910	3.40	2	12.99
8PB-1	ISA	45	X	45	X	5	1.910	3.40	1	6.49
8PB-2	ISA	45	X	45	X	5	1.910	3.40	1	6.49
9CR-1	ISA	45	X	45	X	5	0.293	3.40	1	1.00
9CR-2	ISA	45	X	45	X	5	0.355	3.40	1	1.21
9CL-1	ISA	45	X	45	X	5	0.392	3.40	1	1.33
9CL-2	ISA	45	X	45	X	5	0.337	3.40	1	1.15
8CR-1	ISA	45	X	45	X	5	0.297	3.40	1	1.01
8CR-2	ISA	45	X	45	X	5	0.353	3.40	1	1.20
8CL-1	ISA	45	X	45	X	5	0.388	3.40	1	1.32
8CL-2	ISA	45	X	45	X	5	0.340	3.40	1	1.16
SL-5	ISA	130	X	130	X	12	0.440	23.40	4	41.18
CP-5	PL.	105	X	8	X		0.440	6.59	8	23.21
SL-6	ISA	110	X	110	X	10	0.440	16.50	4	29.04
CP-6	PL.	105	X	8	X		0.440	6.59	8	23.21
PP-6	PL.	115	X	2	X		0.215	1.81	8	3.11
SL-7	ISA	110	X	110	X	10	0.330	16.50	4	21.78
CP-7	PL.	90	X	8	X		0.293	5.65	8	13.25
SL-8	ISA	60	X	60	X	6	0.226	5.40	8	9.76
CP-8	PL.	50	X	6	X		0.196	2.36	16	7.39
									TOTAL	1977.95

COOMPONENT OF PENAL 07 FOR 40 M NARROW BASE OWER										TYPE- 40 -IIT
REF. DEG. NO.- FEBRICATION DETAIL-2										
MEMBER NO.	SECTION						LENGTH (M)	UNIT WT. (KG/M)	QUAN-TITY (Nos.)	TOTAL WEIGHT (Kg.)
		(mm)		(mm)		(mm)				
7L	ISA	110	X	110	X	10	3.504	16.50	4	231.26
7D	ISA	50	x	50	x	6	4.262	4.50	8	153.43
7H	ISA	45	X	45	X	5	1.199	3.40	6	24.46
7H-1	ISA	45	x	45	x	5	1.199	3.40	2	8.15
7B-1	ISA	45	X	45	X	5	0.617	3.40	8	16.78
7B-2	ISA	45	X	45	X	5	1.032	3.40	8	28.07
7B-3	ISA	45	X	45	X	5	0.998	3.40	8	27.15
7PB	ISA	45	x	45	x	5	1.619	3.40	2	11.01
7PB-2	ISA	45	x	45	x	5	1.619	3.40	1	5.50
7CR-1	ISA	45	x	45	x	5	0.353	3.40	1	5.50
7CR-2	ISA	45	X	45	X	5	0.297	3.40	1	1.20
7CL-1	ISA	45	X	45	X	5	0.341	3.40	1	1.01
7CL-2	ISA	45	X	45	X	5	0.387	3.40	1	1.16
6L	ISA	100	X	45	X	8	3.004	12.10	1	145.39
6D	ISA	50	X	100	X	6	3.662	4.50	4	131.83
6H	ISA	45	x	50	x	5	1.045	3.40	8	21.32
6H-1	ISA	45	X	45	X	5	1.045	3.40	6	7.11
6B-1	ISA	45	X	45	X	5	0.545	3.40	2	14.82
6B-2	ISA	45	X	45	X	5	0.835	3.40	8	22.71
6PB	ISA	45	X	45	X	5	1.395	3.40	8	9.49
6PB-1	ISA	45	X	45	X	5	1.395	3.40	2	4.74
6PB-2	ISA	45	X	45	X	5	1.395	3.40	1	4.74
6CR-1	ISA	45	X	45	X	5	0.353	3.40	1	1.20
6CR-2	ISA	45	X	45	X	5	0.299	3.40	1	1.02
6CL-1	ISA	45	X	45	X	5	0.342	3.40	1	1.16
6CL-2	ISA	45	X	45	X	5	0.384	3.40	1	1.31
5L	ISA	90	X	45	X	8	3.004	10.80	1	129.77
5D	ISA	50	X	45	X	6	3.508	4.50	4	126.29
5H-1	ISA	55	X	45	X	6	1.762	4.90	8	8.63
5H-2	ISA	55	X	90	X	6	1.762	4.90	1	8.63
5H-3	ISA	45	X	50	X	6	2.607	4.90	1	12.77
5H-4	ISA	45	X	55	X	6	2.607	4.90	1	12.77
5B-1	ISA	45	X	55	X	5	0.483	3.40	1	13.14
5B-2	ISA	45	X	55	X	5	0.848	3.40	8	23.07
5CR-1	ISA	45	X	55	X	5	1.129	3.40	8	3.84
5CR-2	ISA	45	X	45	X	5	1.129	3.40	1	3.84
5CL-1	ISA	45	X	45	X	5	0.329	3.40	1	1.12
5CL-2	ISA	45	X	45	X	5	0.329	3.40	1	1.12
SL-7	ISA	100	X	100	X	8	0.330	12.10	1	15.97
CP-7	ISA	50	X	8	X		0.330	3.14	8	8.29
SL-9	PL.	90	X	90	X	8	0.330	10.80	4	14.26
CP-9	ISA	85	X	6	X		0.330	4.00	8	10.57
PP-9	PL.	85	X	2	X		0.160	1.33	8	1.71
SL-10	PL.	75	X	75	X	6	0.260	6.80	4	7.07
CP-10	ISA	50	X	6	X		0.235	2.36	8	4.443
SL-11	ISA	65	X	65	X	6	0.260	5.80	4	6.03
CP-11	PL.	50	X	6	X		0.235	2.36	8	4.43
PP-11	PL.	65	X	2	X		0.100	1.02	8	0.82
5G	PL.	110	X	6	X		0.282	5.18	8	11.69
6G	PL.	112	X	6	X		0.254	5.28	8	10.72
TOTAL									1323.83	

COOMPONENT OF PENAL 04 FOR 40 M NARROW BASE OWER										TYPE- 40 -IIT
REF. DEG. NO.- FEBRICATION DETAIL-1										
MEMBER NO.		SECTION					LENGTH	UNIT WT.	QUAN-TITY	TOTAL WEIGHT
		(mm)		(mm)		(mm)				
4L	ISA	75	X	75	X	6	3.004	6.80	4	81.71
4D	ISA	50	x	50	x	5	3.311	3.80	8	100.65
4H	ISA	45	X	45	X	5	0.769	3.40	6	15.69
4H-1	ISA	45	x	45	x	5	0.769	3.40	2	5.23
4B-1	ISA	45	X	45	X	5	0.415	3.40	8	11.29
4B-2	ISA	45	X	45	X	5	0.799	3.40	8	21.73
4CR-1	ISA	45	X	45	X	5	0.353	3.40	1	1.20
4CR-2	ISA	45	x	45	x	5	0.302	3.40	1	1.03
4CL-1	ISA	45	x	45	x	5	0.234	3.40	1	0.80
4CL-2	ISA	45	x	45	x	5	0.286	3.40	1	0.97
3L	ISA	75	X	75	X	5	3.004	5.70	4	68.49
3D	ISA	45	X	45	X	5	2.727	3.40	8	74.17
3CR-1	ISA	45	X	45	X	5	1.129	3.40	1	3.84
3CR-2	ISA	45	X	45	X	5	1.129	3.40	1	3.84
3CL-1	ISA	45	X	45	X	5	0.329	3.40	1	1.12
3CL-2	ISA	45	x	45	x	5	0.329	3.40	1	1.12
2L	ISA	75	X	75	X	5	4.595	5.70	4	104.77
2D	ISA	45	X	45	X	5	2.727	3.40	8	74.17
2H	ISA	45	X	45	X	5	0.700	3.40	18	14.28
2H-1	ISA	45	X	45	X	5	0.700	3.40	6	42.84
2CR-1	ISA	45	X	45	X	5	0.353	3.40	2	2.40
2CR-2	ISA	45	X	45	X	5	0.302	3.40	2	2.05
2CL-1	ISA	45	X	45	X	5	0.346	3.40	2	2.35
2CL-2	ISA	45	X	45	X	5	0.387	3.40	2	2.63
2PB	ISA	45	X	45	X	5	0.881	3.40	2	5.99
2PB-1	ISA	45	X	45	X	5	0.881	3.40	1	3.00
2PB-2	ISA	45	X	45	X	5	0.881	3.40	1	3.00
1D	ISA	45	X	45	X	5	2.727	3.40	8	74.17
1H	ISA	45	X	45	X	5	1.350	3.40	3	13.77
1H-1	ISA	45	X	45	X	5	1.350	3.40	1	4.59
1CR-1	ISA	45	X	45	X	5	0.360	3.40	1	1.22
1CR-2	ISA	45	X	45	X	5	0.360	3.40	1	1.22
1CL-1	ISA	45	X	45	X	5	0.329	3.40	1	1.12
1CL-2	ISA	45	X	45	X	5	0.329	3.40	1	1.12
1PB	ISA	45	X	45	X	5	0.917	3.40	2	6.24
1PB-1	ISA	45	X	45	X	5	0.917	3.40	1	3.12
1PB-2	ISA	45	X	45	X	5	0.917	5.70	1	3.12
1CR-1A	ISA	45	X	45	X	5	0.353	3.40	1	1.20
1CR-2A	ISA	45	X	45	X	5	0.353	3.40	1	1.14
1CL-1A	ISA	45	X	45	X	5	0.336	3.40	1	1.14
1CL-2A	ISA	45	X	45	X	5	0.336	3.40	1	6.03
SL-11	ISA	65	X	65	X	6	0.260	5.80	4	4.43
CP-11	PL.	50	X	6	X		0.235	2.36	8	0.63
PP-11	PL.	50	X	2	X		0.100	0.79	8	6.03
SL-12	ISA	65	X	65	X	6	0.260	5.80	4	4.43
CP-12	PL.	50	X	6	X		0.235	2.36	8	0.63
SL-13	ISA	65	X	65	X	6	0.260	5.80	4	6.03
CP-13	PL.	50	X	6	X		0.235	2.36	8	4.43
CP-14	PL.	50	X	6	X		0.181	2.36	2	0.85
LT-A	ISA	75	X	75	X	5	0.438	5.70	1	2.50
LT-B	PL.	50	X	6	X		0.150	2.36	1	0.35
									TOTAL	800.44

(40 M HIGH TOWER, DETAIL OF PLATFORM)								TYPE- 40 -IIT		
MEMBER NO.	SECTION						LENG TH	UNIT WT.	QUAN- TITY	TOTAL WEIGHT
	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(M)	(KG/M)	(Nos.)	(Kg.)
PLATFORM FOR GSM ANTENNA LVL 12 M FROM TOP										
5PF-1	PL.	45	X	5	X		1.688	1.77	3	8.94
5PF-2	ISA	60	x	60	x	5	0.100	4.50	10	4.50
5PF-3	ISA	55	X	55	X	6	1.923	4.90	1	9.42
5PF-4	ISA	45	x	45	x	5	1.233	3.40	2	8.38
5PF-5	ISA	45	X	45	X	5	1.399	3.40	2	9.51
5PF-6	ISA	45	X	45	X	5	1.233	3.40	1	4.19
5PF-7	ISA	45	X	45	X	5	1.233	3.40	1	4.19
5PF-8	ISA	45	x	45	x	5	1.080	3.40	2	7.34
5PF-9	PL.	110	x	6	x		0.100	5.18	2	1.04
5PF-10	PL.	45	x	5	x		0.985	1.77	2	3.48
5PF-11	ISA	55	X	55	X	5	1.010	4.10	2	8.28
5PF-12	ISA	55	X	55	X	5	1.843	4.10	1	7.56
5PF-13	PL.	45	X	5	X		1.843	1.77	1	3.26
5PF-14	ISA	55	X	55	X	5	1.843	4.10	1	7.56
CHQD. PLATE										
5CH-1	PL.	1399	x	5	x		1.399	54.91	1	76.82
5CH-2	PL.	922	X	5	X		0.922	36.19	2	33.37
5CH-3	PL.	632	X	5	X		0.866	24.81	1	21.48
5CH-3A	PL.	632	X	5	X		0.866	24.81	1	21.48
5CH-4	PL.	676	X	5	X		0.765	26.53	1	20.30
5CH-4A	PL.	676	X	5	X		0.765	26.53	1	20.30
PLATFORM FOR 0.6 M DIA ANTENNA LVL 7.5 M FROM TOP										
3PF-1	ISA	55	X	55	X	6	1.350	4.90	1	6.62
3PF-2	PL.	45	X	5	X		0.800	1.77	3	4.24
3PF-3	PL.	45	X	5	X		1.350	1.77	3	7.15
3PF-4	ISA	55	X	55	X	6	1.350	4.90	1	6.62
3PF-5	ISA	55	X	55	X	6	2.165	4.90	1	10.61
3PF-6	ISA	55	X	55	X	6	2.165	4.90	1	10.61
3PF-7	ISA	55	X	55	X	6	1.490	4.90	1	7.30
3PF-8	ISA	60	X	60	X	5	0.100	4.50	9	4.05
3PF-9	ISA	45	X	45	X	5	0.927	3.40	2	6.30
3PF-10	ISA	60	X	60	X	5	1.094	4.50	2	9.85
3PF-11	ISA	45	X	45	X	5	0.927	3.40	1	3.15
3PF-12	ISA	45	X	45	X	5	0.927	3.40	1	3.15
3PF-13	ISA	55	X	55	X	5	0.949	4.10	2	7.78
3PF-14	PL.	110	X	6	X		0.100	5.18	4	2.07
3PF-15	PL.	45	X	5	X		0.949	1.77	2	3.35
3PF-16	ISA	45	X	45	X	5	1.080	3.40	1	3.67
3PF-17	ISA	55	X	55	X	5	1.410	4.10	1	5.78
3PF-18	FL	45	X	5			1.410	1.77	1	2.49
CHQD. PLATE										
3CH-1	PL.	1094	X	5			1.094	42.94	1	46.98
3CH-2	PL.	703	X	5			0.703	27.59	2	19.40
3CH-3	PL.	416	X	5			0.670	16.33	1	10.94
3CH-3A	PL.	416	X	5			0.670	16.33	1	10.94
3CH-4	PL.	460	X	5			0.765	18.06	1	13.81
3CH-4A	PL.	460	X	5			0.765	18.06	1	13.81

Appendix II

(30 M HIGH TOWER, DETAIL OF PLATFORM)								TYPE- 40 -IIT			
MEMBER NO.		SECTION						LENGT H (M)	UNIT WT. (KG/M)	QUAN- TITY (Nos.)	TOTAL WEIGHT (Kg.)
		(mm)		(mm)		(mm)					
PLATFORM FOR GSM ANTENNA LVL 2.5 M FROM TOP											
1PF-1	PL.	55	X	55	X	5	1.027	4.10	8	33.69	
1PF-2	ISA	100	x	100	x	8	0.150	12.10	8	14.52	
1PF-3	ISA	55	X	55	X	5	2.972	4.10	1	12.19	
1PF-4	ISA	45	x	45	x	5	0.796	3.40	3	8.12	
1PF-5	ISA	55	X	55	X	5	2.972	4.10	4	12.19	
1PF-6	ISA	55	X	55	X	5	1.105	4.10	2	18.12	
1PF-7	ISA	45	X	45	X	5	0.920	3.40	1	6.26	
1PF-8	ISA	45	x	45	x	5	0.920	3.40	1	3.13	
1PF-9	ISA	45	x	45	x	5	0.920	3.40	2	3.13	
1PF-10	ISA	45	x	45	x	5	0.796	3.40	2	5.41	
1PF-11	ISA	55	X	55	X	5	1.360	4.10	2	11.51	
1PF-12	ISA	55	X	55	X	5	0.796	4.10	2	6.53	
1PF-13	PL.	55	X	55	X	5	0.796	4.10	2	6.53	
1PF-14	ISA	55	X	55	X	5	1.480	4.10	4	2427	
1PF-16	PL.	110	X	6	X		0.100	5.18	16	8.29	
1PF-17	PL.	45	x	6	x		0.121	2.12	8	2.05	
1PF-18	FL	45	X	5	X		1.089	1.77	4	7.69	
1PF-19	ISA	45	x	45	x	5	1.089	3.40	4	14.81	
1PF-20	ISA	45	X	45	X	5	1.085	3.40	4	14.76	
1PF-21	ISA	45	X	45	X	5	1.085	3.40	4	14.76	
1PF-22	FL	45	X	5	X		1.410	1.77	4	9.96	
1PF-23	ISA	45	x	45	x	5	1.085	3.40	4	14.76	
1PF-24	ISA	45	x	45	x	5	1.085	3.40	4	14.76	
1PF-25	ISA	55	x	55	x	6	1.410	4.90	4	27.64	
1PF-26	PL.	45	X	5	X		0.800	1.77	3	4.24	
1PF-27	ISA	45	X	45	X	5	1.350	3.40	3	13.77	
1PF-28	PL.	100	X	6	X		0.160	4.71	8	6.03	
CHQD. PLATE											
1CH-1	PL.	1399	x	5	x		1.399	54.91	1	76.82	
1CH-2	PL.	922	X	5	X		0.922	36.19	2	33.37	
1CH-3	PL.	632	X	5	X		0.866	24.81	1	21.48	
									TOATL	1017.91	

Appendix II

(40 M HIGH TOWER , DETAIL OF LADDER, SHEET NO-6)								TYPE -40-IIT		
MEMBER NO.		SECTION					LENGT H	UNIT WT.	QUAN-TITY	TOTAL WEIGHT
		(mm)		(mm)		(mm)	(M)	(KG/M)	(Nos.)	(Kg.)
LR										
BC	ISA	50	X	50	X	5	0.150	3.80	2	1.14
B	ISA	45	X	45	X	5	0.707	3.40	2	4.81
C	RUNG	16	DIA				0.458	1.60	3	2.20
11LR TO 6 LR										
B	ISA	45	X	45	X	5	4.994	3.40	12	203.76
C	RUNG	16	DIA				0.458	1.60	120	87.84
5LR										
B	ISA	45	X	45	X	5	4.995	3.40	2	33.97
C	RUNG	16	DIA				0.458	1.60	20	14.64
4LR										
B	ISA	45	X	45	X	5	4.556	3.40	2	30.98
C	RUNG	16	DIA				0.458	1.60	18	13.18
PF-1	PL.	40	X	5			2.207	1.57	3	10.39
PF-2	PL.	40	X	5			4.994	1.57	12	94.09
PF-3	PL.	40	X	5			1.837	1.57	3	8.65
PF-4	PL.	40	X	5			2.050	1.57	3	9.66
PF-5	PL.	40	X	5			3.050	1.57	3	14.37
PR	PL.	40	X	5			1.868	1.57	32	93.85
LC-1	PL.	40	X	6			0.186	1.88	32	11.21
LC-2	PL.	40	X	6			0.186	1.88	15	5.26
									TOTAL	639.98
(30 M HIGH TOWER , DETAIL OF CABLE RACK, SHEET NO-6)								TYPE -40-IIT		
MEMBER NO.		SECTION					LENGT H	UNIT WT.	QUAN-TITY	TOTAL WEIGHT
		(mm)		(mm)		(mm)	(M)	(KG/M)	(Nos.)	(Kg.)
11CR										
A	PL.	50	X	5			2.725	1.96	2	10.70
B	PL.	40	X	5			0.550	1.57	5	4.32
8CR										
A	PL.	50	X	5			4.994	1.96	2	19.60
B	PL.	40	X	5			0.550	1.57	8	6.91
7CR										
A	PL.	50	X	5			4.994	1.96	2	19.60
B	PL.	40	X	5			0.550	1.57	8	6.91
6CR										
A	PL.	50	X	5			4.994	1.96	2	19.60
B	PL.	40	X	5			0.550	1.57	9	7.77
5CR										
A	PL.	50	X	5			4.994	1.96	2	19.60
B	PL.	40	X	5			0.550	1.57	8	6.91
4CR										
A	PL.	50	X	5			4.994	1.96	2	19.60
B	PL.	40	X	5			0.550	1.57	8	6.91
CL	PL.	40	X	5			0.146	1.57	10	2.29
									TOTAL	150.72

Appendix II

BASE PLATE FOR 40 M. TOWER							SHEET NO.4		0	
MEMBER NO.	SECTION						LENGT H	UNIT WT.	QUAN-TITY	TOTAL WEIGHT
	(mm)		(mm)		(mm)	(M)	(KG/M)	(Nos.)	(Kg.)	
STB-30										
	PL.	350	X	36		0.350	98.91	4	138.47	
	PL.	251	X	10		0.090	19.70	8	14.19	
	PL.	251	X	10		0.110	19.70	8	17.34	
	PL.	251	X	10		0.163	19.70	4	12.85	
	PL.	130	X	130	X	12	0.598	4	55.97	
								TOTAL	238.82	
LIGHTING ARRESTER PAD							SHEET NO.1		0	
MEMBER NO.	SECTION						LENGT H	UNIT WT.	QUAN-TITY	TOTAL WEIGHT
	(mm)		(mm)		(mm)	(M)	(KG/M)	(Nos.)	(Kg.)	
LT										
A	ISA	65	X	65	X	5	0.438	1	2.15	
B	PL.	150	X	6			0.150	1	1.21	
								TOATL	3.21	
AVIATION LAMP PAD							SHEET NO.1		0	
MEMBER NO.	SECTION						LENGT H	UNIT WT.	QUAN-TITY	TOTAL WEIGHT
	(mm)		(mm)		(mm)	(M)	(KG/M)	(Nos.)	(Kg.)	
AV										
A	ISA	65	X	65	X	5	0.438	1	2.15	
B	PL.	160	X	6			0.160	1	1.21	
CP-14	PL.	50	X	6			0.181	2	0.85	
								TOTAL	4.20	
DETAILS OF FUNDATION BOLTS										
MEMBER NO.	SECTION						LENGT H	UNIT WT.	QUAN-TITY	TOTAL WEIGHT
	(mm)		(mm)		(mm)	(M)	(KG/M)	(Nos.)	(Kg.)	
1	32	DIA				0.8	6.953	32	178.00	
2	PL:	80	X	6		0.08	3.768	32	9.65	
SQ WASHER	PL:	80	X	6		0.08	3.768	32	9.65	
NUTS	32	DIA					0.500	64	32.00	
								TOTAL	229.29	
NUTS & BOLTS										
MEMBER NO.	DESCRIPTION OF MEMBER	SECTION				LENGTH	UNIT WEIGHT	QUANTITY	TOTAL WEIGHT	
		mm				(M)	(KG/M)	(Nos.)	(Kg.)	
1	NUTS & BOLTS	12 mm dia				0.030	0.058	110	6.33	
2	NUTS & BOLTS	12 mm dia				0.035	0.062	173	10.73	
3	NUTS & BOLTS	16 mm dia				0.035	0.125	175	21.83	
4	NUTS & BOLTS	16 mm dia				0.040	0.133	640	85.12	
5	NUTS & BOLTS	16 mm dia				0.045	0.144	455	64.16	
6	NUTS & BOLTS	16 mm dia				0.050	0.149	165	24.59	
7	NUTS & BOLTS	16 mm dia				0.050	0.157	90	14.13	
8	NUTS & BOLTS	16 mm dia				0.055	0.164	145	23.78	

9	NUTS & BOLTS		16 mm dia					0.060	0.172		0	0.00
10	PACK WASHERS		PL.	35	X	5	X	0.035	1.37		105	5.05
11	PACK WASHERS		PL.	35	X	6	X	0.035	1.65		10	0.58
12	PACK WASHERS		PL.	35	X	8	X	0.035	2.20		24	1.85
13	PACK WASHERS		PL.	35	X	10	X	0.035	2.75		6	0.58
14	PACK WASHERS		PL.	35	X	12	X	0.035	3.30		6	0.69
15	PACK WASHERS		PL.	35	X	16	X	0.035	4.40		0	0.00
											TOTAL=	259.44

Appendix II

SUMMARY		FOR 30 M NARROW BASE TOWER				WEIGHT	
WEIGHT OF PENE	8&9				=	1978	
WEIGHT OF PENE	5 TO 7				=	1324	
WEIGHT OF PENE	1 TO 4				=	800	
WEIGHT OF PLAT FORM					=	1018	
LADDER					=	640	
V.CABLE RACK					=	206	
LIGHTING ARRESTER					=	3	
AVIATION LAMP					=	4	
WEIGHT OF BASE PLATE					=	239	
FOUNDATION BOLTS					=	229	
C.D.M.A MOUNT					=	189	
0.6 M.W.MOUNT FRAME					=	133	
GSM MOUNT FRAME					=	348	
NUTS & BOLTS					=	259	
TEMPLATE					=	142	
					TOTAL	7280	KG

COOMPONENT OF PENAL 07 FOR 40 M NARROW BASE OWER										TYPE- 40 -IIT	
REF. DEG. NO.- FEBRICATION DETAIL-2											
MEMBER NO.		SECTION					LENGTH (M)	UNIT WT. (KG/M)	QUAN-TITY (Nos.)	TOTAL WEIGHT (Kg.)	
		(mm)		(mm)		(mm)					
7L	ISA	110	X	110	X	10	3.504	16.50	4	231.26	
7D	ISA	50	x	50	x	6	4.262	4.50	8	153.43	
7H	ISA	45	X	45	X	5	1.199	3.40	6	24.46	
7H-1	ISA	45	x	45	x	5	1.199	3.40	2	8.15	
7B-1	ISA	45	X	45	X	5	0.617	3.40	8	16.78	
7B-2	ISA	45	X	45	X	5	1.032	3.40	8	28.07	
7B-3	ISA	45	X	45	X	5	0.998	3.40	8	27.15	
7PB	ISA	45	x	45	x	5	1.619	3.40	2	11.01	
7PB-2	ISA	45	x	45	x	5	1.619	3.40	1	5.50	
7CR-1	ISA	45	x	45	x	5	0.353	3.40	1	5.50	
7CR-2	ISA	45	X	45	X	5	0.297	3.40	1	1.20	
7CL-1	ISA	45	X	45	X	5	0.341	3.40	1	1.01	
7CL-2	ISA	45	X	45	X	5	0.387	3.40	1	1.16	
6L	ISA	100	X	45	X	8	3.004	12.10	1	145.39	
6D	ISA	50	X	100	X	6	3.662	4.50	4	131.83	
6H	ISA	45	x	50	x	5	1.045	3.40	8	21.32	
6H-1	ISA	45	X	45	X	5	1.045	3.40	6	7.11	
6B-1	ISA	45	X	45	X	5	0.545	3.40	2	14.82	
6B-2	ISA	45	X	45	X	5	0.835	3.40	8	22.71	
6PB	ISA	45	X	45	X	5	1.395	3.40	8	9.49	
6PB-1	ISA	45	X	45	X	5	1.395	3.40	2	4.74	
6PB-2	ISA	45	X	45	X	5	1.395	3.40	1	4.74	
6CR-1	ISA	45	X	45	X	5	0.353	3.40	1	1.20	
6CR-2	ISA	45	X	45	X	5	0.299	3.40	1	1.02	
6CL-1	ISA	45	X	45	X	5	0.342	3.40	1	1.16	
6CL-2	ISA	45	X	45	X	5	0.384	3.40	1	1.31	
5L	ISA	90	X	45	X	8	3.004	10.80	1	129.77	
5D	ISA	50	X	45	X	6	3.508	4.50	4	126.29	
5H-1	ISA	55	X	45	X	6	1.762	4.90	8	8.63	
5H-2	ISA	55	X	90	X	6	1.762	4.90	1	8.63	
5H-3	ISA	45	X	50	X	6	2.607	4.90	1	12.77	
5H-4	ISA	45	X	55	X	6	2.607	4.90	1	12.77	
5B-1	ISA	45	X	55	X	5	0.483	3.40	1	13.14	
5B-2	ISA	45	X	55	X	5	0.848	3.40	8	23.07	
5CR-1	ISA	45	X	55	X	5	1.129	3.40	8	3.84	
5CR-2	ISA	45	X	45	X	5	1.129	3.40	1	3.84	
5CL-1	ISA	45	X	45	X	5	0.329	3.40	1	1.12	
5CL-2	ISA	45	X	45	X	5	0.329	3.40	1	1.12	
SL-7	ISA	100	X	100	X	8	0.330	12.10	1	15.97	
CP-7	ISA	50	X	8	X		0.330	3.14	8	8.29	
SL-9	PL.	90	X	90	X	8	0.330	10.80	4	14.26	
CP-9	ISA	85	X	6	X		0.330	4.00	8	10.57	
PP-9	PL.	85	X	2	X		0.160	1.33	8	1.71	
SL-10	PL.	75	X	75	X	6	0.260	6.80	4	7.07	
CP-10	ISA	50	X	6	X		0.235	2.36	8	4.43	
SL-11	ISA	65	X	65	X	6	0.260	5.80	4	6.03	
CP-11	PL.	50	X	6	X		0.235	2.36	8	4.43	
PP-11	PL.	65	X	2	X		0.100	1.02	8	0.82	
5G	PL.	110	X	6	X		0.282	5.18	8	11.69	
6G	PL.	112	X	6	X		0.254	5.28	8	10.72	
5 PF-4	ISA	45	X	45	X	5	1.233	3.40	2	8.38	
5 PF-6	ISA	45	X	45	X	5	1.233	3.40	1	4.19	
5 PF-7	ISAA	45	X	45	X	5	1.233	3.40	1	4.19	
TOTAL										1340.59	

COOMPONENT OF PENAL 04 FOR 40 M NARROW BASE OWER										TYPE- 40 -IIT	
REF. DEG. NO.- FEBRICATION DETAIL-1											
MEMBER NO.		SECTION					LENGTH (M)	UNIT WT. (KG/M)	QUAN-TITY (Nos.)	TOTAL WEIGHT (Kg.)	
		(mm)		(mm)		(mm)					
4L	ISA	75	X	75	X	6	3.004	6.80	4	81.71	
4D	ISA	50	x	50	x	5	3.311	3.80	8	100.65	
4H	ISA	45	X	45	X	5	0.769	3.40	6	15.69	
4H-1	ISA	45	x	45	x	5	0.769	3.40	2	5.23	
4B-1	ISA	45	X	45	X	5	0.415	3.40	8	11.29	
4B-2	ISA	45	X	45	X	5	0.799	3.40	8	21.73	
4CR-1	ISA	45	X	45	X	5	0.353	3.40	1	1.20	
4CR-2	ISA	45	x	45	x	5	0.302	3.40	1	1.03	
4CL-1	ISA	45	x	45	x	5	0.234	3.40	1	0.80	
4CL-2	ISA	45	x	45	x	5	0.286	3.40	1	0.97	
3L	ISA	75	X	75	X	5	3.004	5.70	4	68.49	
3D	ISA	45	X	45	X	5	2.727	3.40	8	74.17	
3CR-1	ISA	45	X	45	X	5	1.129	3.40	1	3.84	
3CR-2	ISA	45	X	45	X	5	1.129	3.40	1	3.84	
3CL-1	ISA	45	X	45	X	5	0.329	3.40	1	1.12	
3CL-2	ISA	45	x	45	x	5	0.329	3.40	1	1.12	
2L	ISA	75	X	75	X	5	4.595	5.70	4	104.77	
2D	ISA	45	X	45	X	5	2.727	3.40	8	74.17	
2H	ISA	45	X	45	X	5	0.700	3.40	18	14.28	
2H-1	ISA	45	X	45	X	5	0.700	3.40	6	42.84	
2CR-1	ISA	45	X	45	X	5	0.353	3.40	2	2.40	
2CR-2	ISA	45	X	45	X	5	0.302	3.40	2	2.05	
2CL-1	ISA	45	X	45	X	5	0.346	3.40	2	2.35	
2CL-2	ISA	45	X	45	X	5	0.387	3.40	2	2.63	
2PB	ISA	45	X	45	X	5	0.881	3.40	2	5.99	
2PB-1	ISA	45	X	45	X	5	0.881	3.40	1	3.00	
2PB-2	ISA	45	X	45	X	5	0.881	3.40	1	3.00	
1D	ISA	45	X	45	X	5	2.727	3.40	8	74.17	
1H	ISA	45	X	45	X	5	1.350	3.40	3	13.77	
1H-1	ISA	45	X	45	X	5	1.350	3.40	1	4.59	
1CR-1	ISA	45	X	45	X	5	0.360	3.40	1	1.22	
1CR-2	ISA	45	X	45	X	5	0.360	3.40	1	1.22	
1CL-1	ISA	45	X	45	X	5	0.329	3.40	1	1.12	
1CL-2	ISA	45	X	45	X	5	0.329	3.40	1	1.12	
1PB	ISA	45	X	45	X	5	0.917	3.40	2	6.24	
1PB-1	ISA	45	X	45	X	5	0.917	3.40	1	3.12	
1PB-2	ISA	45	X	45	X	5	0.917	5.70	1	3.12	
1CR-1A	ISA	45	X	45	X	5	0.353	3.40	1	1.20	
1CR-2A	ISA	45	X	45	X	5	0.353	3.40	1	1.14	
1CL-1A	ISA	45	X	45	X	5	0.336	3.40	1	1.14	
1CL-2A	ISA	45	X	45	X	5	0.336	3.40	1	6.03	
SL-11	ISA	65	X	65	X	6	0.260	5.80	4	4.43	
CP-11	PL.	50	X	6	X		0.235	2.36	8	0.63	
PP-11	PL.	50	X	2	X		0.100	0.79	8	6.03	
SL-12	ISA	65	X	65	X	6	0.260	5.80	4	4.43	
CP-12	PL.	50	X	6	X		0.235	2.36	8	0.63	
SL-13	ISA	65	X	65	X	6	0.260	5.80	4	6.03	
CP-13	PL.	50	X	6	X		0.235	2.36	8	4.43	
CP-14	PL.	50	X	6	X		0.181	2.36	2	0.85	
LT-A	ISA	75	X	75	X	5	0.438	5.70	1	2.50	
LT-B	PL.	50	X	6	X		0.150	2.36	1	0.35	
TOTAL									800.44		

(20 M HIGH TOWER, DETAIL OF PLATFORM)										Type-40-IIT		
MEMBER NO.	SECTION	SECTION						LENGTH	UNIT WT.	QUAN-TITY	TOTAL WEIGHT	
		(mm)		(mm)		(mm)	(M)	(KG/M)	(Nos.)	(Kg.)		
PLATFORM FOR 0.6 M DIA ANTENNA LVL 7.5 M FROM TOP												
3PF-1	ISA	55	X	55	X	6	1.350	4.90	1	6.62		
3PF-2	PL.	45	X	5	X		0.800	1.77	3	4.24		
3PF-3	PL.	45	X	5	X		1.350	1.77	3	7.15		
3PF-4	ISA	55	X	55	X	6	1.350	4.90	1	6.62		
3PF-5	ISA	55	X	55	X	6	2.165	4.90	1	10.61		
3PF-6	ISA	55	X	55	X	6	2.165	4.90	1	10.61		
3PF-7	ISA	55	X	55	X	6	1.490	4.90	1	7.30		
3PF-8	ISA	60	X	60	X	5	0.100	4.50	9	4.05		
3PF-9	ISA	45	X	45	X	5	0.927	3.40	2	6.30		
3PF-10	ISA	60	X	60	X	5	1.094	4.50	2	9.85		
3PF-11	ISA	45	X	45	X	5	0.927	3.40	1	3.15		
3PF-12	ISA	45	X	45	X	5	0.927	3.40	1	3.15		
3PF-13	ISA	55	X	55	X	5	0.949	4.10	2	7.78		
3PF-14	PL.	110	X	6	X		0.100	5.18	4	2.07		
3PF-15	PL.	45	X	5	X		0.949	1.77	2	3.35		
3PF-16	ISA	45	X	45	X	5	1.080	3.40	1	3.67		
3PF-17	ISA	55	X	55	X	5	1.410	4.10	1	5.78		
3PF-18	FL	45	X	5			1.410	1.77	1	2.49		
CHQD. PLATE												
3CH-1	PL.	1094	X	5			1.094	42.94	1	46.98		
3CH-2	PL.	703	X	5			0.703	27.59	2	19.40		
3CH-3	PL.	416	X	5			0.670	16.33	1	10.94		
3CH-3A	PL.	416	X	5			0.670	16.33	1	10.94		
3CH-4	PL.	460	X	5			0.765	18.06	1	13.81		
3CH-4A	PL.	460	X	5			0.765	18.06	1	13.81		
(20 M HIGH TOWER, DETAIL OF PLATFORM)										TYPE- 40 -IIT		
MEMBER NO.	SECTION	SECTION						LENGTH	UNIT WT.	QUAN-TITY	TOTAL WEIGHT	
		(mm)		(mm)		(mm)	(M)	(KG/M)	(Nos.)	(Kg.)		
PLATFORM FOR GSM ANTENNA LVL 2.5 M FROM TOP												
1PF-1	PL.	55	X	55	X	5	1.027	4.10	8	33.69		
1PF-2	ISA	100	x	100	x	8	0.150	12.10	8	14.52		
1PF-3	ISA	55	X	55	X	5	2.972	4.10	1	12.19		
1PF-4	ISA	45	x	45	x	5	0.796	3.40	3	8.12		
1PF-5	ISA	55	X	55	X	5	2.972	4.10	4	12.19		
1PF-6	ISA	55	X	55	X	5	1.105	4.10	2	18.12		
1PF-7	ISA	45	X	45	X	5	0.920	3.40	1	6.26		
1PF-8	ISA	45	x	45	x	5	0.920	3.40	1	3.13		
1PF-9	ISA	45	x	45	x	5	0.920	3.40	2	3.13		
1PF-10	ISA	45	x	45	x	5	0.796	3.40	2	5.41		
1PF-11	ISA	55	X	55	X	5	1.360	4.10	2	11.51		
1PF-12	ISA	55	X	55	X	5	0.796	4.10	2	6.53		
1PF-13	PL.	55	X	55	X	5	0.796	4.10	2	6.53		
1PF-14	ISA	55	X	55	X	5	1.480	4.10	4	24.27		
1PF-16	PL.	110	X	6	X		0.100	5.18	16	8.29		
1PF-17	PL.	45	x	6	x		0.121	2.12	8	2.05		
1PF-18	FL	45	X	5	X		1.089	1.77	4	7.69		
1PF-19	ISA	45	x	45	x	5	1.089	3.40	4	14.81		
1PF-20	ISA	45	X	45	X	5	1.085	3.40	4	14.76		
1PF-21	ISA	45	X	45	X	5	1.085	3.40	4	14.76		
1PF-22	FL	45	X	5	X		1.410	1.77	4	9.96		
1PF-23	ISA	45	x	45	x	5	1.085	3.40	4	14.76		
1PF-24	ISA	45	x	45	x	5	1.085	3.40	4	14.76		
1PF-25	ISA	55	x	55	x	6	1.410	4.90	4	27.64		
1PF-26	PL.	45	X	5	X		0.800	1.77	3	4.24		
1PF-27	ISA	45	X	45	X	5	1.350	3.40	3	13.77		
1PF-28	PL.	100	X	6	X		0.160	4.71	8	6.03		
CHQD. PLATE												
1CH-1	PL.	831	x	5			0.831	32.62	4	54.21		
1CH-2	PL.	1340	X	5			0.726	52.60	3	125.60		
1CH-3	PL.	277	X	5			0.726	10.87	2	17.31		
TOATL									736.51			

(40 M HIGH TOWER , DETAIL OF LADDER, SHEET NO-6)							TYPE -40-IIT			
MEMBER NO.		SECTION				LENG TH	UNIT WT.	QUAN-TITY	TOTAL WEIGHT	
		(mm)		(mm)		(mm)	(M)	(KG/M	(Nos.)	(Kg.)
LR										
BC	ISA	50	X	50	x	5	0.150	3.80	2	1.14
B	ISA	45	X	45	X	5	0.707	3.40	2	4.81
C	RUNG	16	DIA				0.458	1.60	3	2.20
9 LR TO 6 LR										
B	ISA	45	X	45	X	5	4.994	3.40	12	203.76
C	RUNG	16	DIA				0.458	1.60	120	87.84
5LR										
B	ISA	45	X	45	x	5	4.995	3.40	2	33.97
C	RUNG	16	DIA				0.458	1.60	20	14.64
4LR										
B	ISA	45	X	45	X	5	4.556	3.40	2	30.98
C	RUNG	16	DIA				0.458	1.60	18	13.18
PF-1	PL.	40	X	5			2.207	1.57	3	10.39
PF-2	PL.	40	X	5			4.994	1.57	6	47.04
PF-4	PL.	40	X	5			2.050	1.57	3	9.66
PF-5	PL.	40	X	5			3.050	1.57	3	14.37
PR	PL.	40	X	5			1.868	1.57	20	58.66
LC-1	PL.	40	X	6			0.186	1.88	18	6.31
LC-2	PL.	40	X	6			0.186	1.88	6	2.10
									TOTAL	346.63
(20 M HIGH TOWER , DETAIL OF CABLE RACK, SHEET NO-6)							TYPE -40-IIT			
MEMBER NO.		SECTION				LENG TH	UNIT WT.	QUAN-TITY	TOTAL WEIGHT	
		(mm)		(mm)		(mm)	(M)	(KG/M	(Nos.)	(Kg.)
11CR										
A	PL.	50	X	5			2.725	1.96	2	10.70
B	PL.	40	X	5			0.550	1.57	5	4.32
6CR										
A	PL.	50	X	5			4.994	1.96	2	19.60
B	PL.	40	X	5			0.550	1.57	9	7.77
5CR										
A	PL.	50	X	5			4.994	1.96	2	19.60
B	PL.	40	X	5			0.550	1.57	8	6.91
4CR										
A	PL.	50	X	5			4.994	1.96	2	19.60
B	PL.	40	X	5			0.550	1.57	8	6.91
CL	PL.	40	X	5			0.146	1.57	6	1.38
									TOTAL	96.78
BASE PLATE FOR 40 M. TOWER				SHEET NO.4			TYPE -40-IIT			
MEMBER NO.		SECTION				LENG TH	UNIT WT.	QUAN-TITY	TOTAL WEIGHT	
		(mm)		(mm)		(mm)	(M)	(KG/M	(Nos.)	(Kg.)
STB-20										
	PL.	300	X	25			0.300	58.88	4	70.65
	PL.	150	X	8			0.110	9.42	8	8.29
	PL.	150	X	8			0.065	9.42	8	4.90
	PL.	150	X	8			0.120	9.42	4	4.52
	ISA	100	X	110	X	10	0.598	23.40	4	55.97
									TOTAL	144.33

LIGHTING ARRESTER PAD							SHEET NO.1		TYPE -40-IIT			
MEMBER NO.		SECTION					LENGT H	UNIT WT.	QUAN-TITY	TOTAL WEIGHT		
		(mm)		(mm)		(mm)	(M)	(KG/M)	(Nos.)	(Kg.)		
LT												
A	ISA	75	X	75	X	5	0.438	5.70	1	2.50		
B	PL.	50	X	6	X		0.150	2.36	1	0.35		
									TOATL	2.85		
AVIATION LAMP PAD							SHEET NO.1		TYPE -40-IIT			
MEMBER NO.		SECTION					LENGT H	UNIT WT.	QUAN-TITY	TOTAL WEIGHT		
		(mm)		(mm)		(mm)	(M)	(KG/M)	(Nos.)	(Kg.)		
AV												
A	ISA	65	X	65	X	5	0.438	4.90	1	2.15		
B	PL.	160	X	6			0.160	7.54	1	1.21		
CP-14	PL.	50	X	6			0.181	2.36	2	0.85		
									TOTAL	4.20		
DETAILS OF FOUNDATION BOL TS												
MEMBER NO.		SECTION					LENGTH	UNIT WT.	QUAN-TITY	TOTAL WEIGHT		
		(mm)		(mm)		(mm)	(M)	(KG/M)	(Nos.)	(Kg.)		
1	32	DIA					0.6	6.953	16	66.75		
2	PL:	80	X	6			0.08	3.768	16	4.82		
SQ WASHER	PL:	80	X	6			0.08	3.768	16	4.82		
NUTS	32	DIA						0.500	32	16.00		
									TOTAL	92.40		
NUTS & BOLTS												
MEMBER NO.	DESCRIPTION OF MEMBER	SECTION					LENGTH	UNIT WEIGHT	QUANTITY	TOTAL WEIGHT		
		mm					(M)	(KG/M)	(Nos.)	(Kg.)		
1	NUTS & BOLTS	12 mm dia					0.030	0.058	160	9.20		
2	NUTS & BOLTS	12 mm dia					0.035	0.062	245	15.19		
3	NUTS & BOLTS	16 mm dia					0.035	0.125	195	24.38		
4	NUTS & BOLTS	16 mm dia					0.040	0.133	710	94.43		
5	NUTS & BOLTS	16 mm dia					0.045	0.144	695	98.00		
6	NUTS & BOLTS	16 mm dia					0.050	0.149	310	46.19		
7	NUTS & BOLTS	16 mm dia					0.050	0.157	120	18.84		
8	NUTS & BOLTS	16 mm dia					0.055	0.164	145	23.78		
9	NUTS & BOLTS	16 mm dia					0.060	0.172	190	32.68		
10	PACK WASHERS	PL.	35	X	5	X	0.035	1.37	105	5.05		
11	PACK WASHERS	PL.	35	X	6	X	0.035	1.65	18	1.04		
12	PACK WASHERS	PL.	35	X	8	X	0.035	2.20	24	1.85		
13	PACK WASHERS	PL.	35	X	10	X	0.035	2.75	0	0.00		
14	PACK WASHERS	PL.	35	X	12	X	0.035	3.30	0	0.00		
15	PACK WASHERS	PL.	35	X	16	X	0.035	4.40	0	0.00		
									TOTAL=	193.79		
SUMMARY FOR 20 M NARROW BASE TOWER												
							WEIGHT	TYPE -40-IIT				
	WEIGHT OF PENE	5 TO 7					=	1341				
	WEIGHT OF PENE	1 TO 4					=	800				
	WEIGHT OF PLAT FORM						=	737				
	LADDER						=	347				

V.CABLE RACK					=	97							
LIGHTING ARRESTER					=	3							
AVIATION LAMP					=	4							
WEIGHT OF BASE PLATE					=	144							
FOUNDATION BOLTS					=	92							
C.D.M.A MOUNT					=	-							
0.6 M.W.MOUNT FRAME					=	133							
GSM MOUNT FRAME						348							
NUTS & BOLTS					=	194							
TEMPLATE					=	89							
					TOTAL	4329	KG						