

**Template for submitting comments/inputs on the draft GR titled “40, 30 and 20 meter towers for cellular systems” (Draft GR No. TEC 45070:2026 )**

Name of manufacturer/Stakeholder:

Organization:

Contact Details : Phone/Mobile ..... Email .....

<u>Clause No.</u>	<u>Clause Description</u>	<u>Comments, if any</u>	<u>Remarks, if any</u>

**Note : The comments/inputs are invited on the draft GR (Draft GR No. TEC 45070:2026 ) in the prescribed format through email to [adetr.tec@gov.in](mailto:adetr.tec@gov.in) with copy to [dirr1.tec-dot@gov.in](mailto:dirr1.tec-dot@gov.in) and [ddgsat.tec@gov.in](mailto:ddgsat.tec@gov.in) at the earliest and within prescribed time period (60 days)**

RADIO DIVISION  
ISSUE-~~DECEMBER~~  
~~XXXX~~202604

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40, 30 AND 20 METER TOWERS FOR CELLULAR SYSTEMS

GENERIC REQUIRMENTS

GR No: ~~GR/TWR-11/01-DEC-TEC 45070~~:202604

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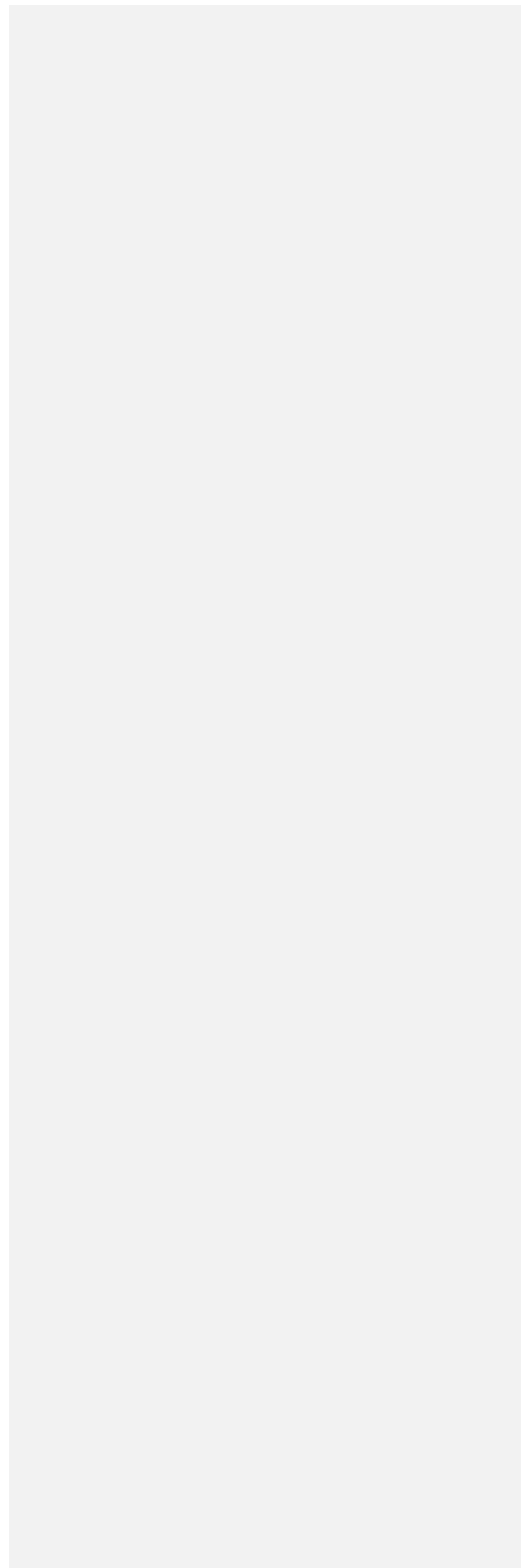
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### HISTORY SHEET

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 20042604.

<u>S.No.</u>	Standard / Document no.	Title	<u>Remarks</u>
<u>1.</u>	<u>GR/TWR-11/01,DEC 2004.</u>	<u>40m, 30m, and 20m Towers for Cellular Systems</u>	<u>First Issue</u>
<u>2.</u>	<u>TEC45070:2026</u>	<u>Standard for Generic Requirements for "40m, 30m, and 20m Towers for Cellular Systems"</u>	<u>Second Issue</u>

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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	1972	Specification for Heavy washers for steel structures
	IS : 6639	<del>1972</del> 2005	Specification of Hexagon Bolts for steel structures
	IS: 12427	2001	Fasteners – Threaded fasteners - Hexagon head transmission Bolts
	IS: 1367	2002	Technical supply Condition for Threaded steel fasteners (Third Revision-) (part 8).
	IS: 4000	1992	Code of Practice for High Strength Bolts in Steel Structures
	IS: 6610	1972	Specification for Heavy Washers for Steel Structures
	IS: 3757	1985	Specification for High Strength Structure Bolts
	IS: 6623	2004	High Strength Structural Nuts
	IS: 1367	Part 6: 2025	Technical Supply conditions of threaded steel Partners- part 6. Mechanical properties of fasteners made of carbon steel and alloy Steel - Nuts with Specified Property class.
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
20.	IS: 17740	2022	Code of practice for Isolated Towers, Masts and Poles Using Structural Steel
21	IS:2309	2005	Code of Practice for Protection of Structures Against Lightning

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**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 ~~three/four legged~~ three/four legged angular/tubular/hybrid 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; OR 6 nos. of panel antennas for GSM and equivalent systems at 9.5m below the top platform.~~

(a)

(b) 3 Nos. of 0.6 diameter microwave solid dish antennas at a platform ~~6m below the top platform;~~

~~6 nos. of panel antennas for GSM systems at 9.5m below the top platform. OR~~

The Antennae as specified by Purchaser

OR

The Effective Projected Area (EPA) of Tower with Payload and peripheral accessories as specified by Purchaser.

~~(c)~~

(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) 3 Nos. of 0.6m diameter microwave solid dish antenna at a platform 5m below top platform.~~

~~(b)~~

The Antennae as specified by Purchaser

OR

(c) The Effective Projected Area (EPA) of Tower with Payload and peripheral accessories as specified by Purchaser

OR

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

**PART 2**

**2.0 FUNCTION AND TECHNICAL REQUIRMENTS:**

2.1 **Type of tower** : Three/four legged, ~~square base tower with~~ angular/tubular/hybrid construction. The square top will be of 1300 mm

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sides and the square base as given below:

Design consultant will come up most optimized top example base width of towers (base width of tower varies as per wind speed).

<b>Tower</b>	<b>Base</b>
40m	→ 4500mm
30m	→ 3498mm
20m	→ 2560mm

**2.2 Height of towers** : 40, 30 and 20 meters with 5 meter truncation. The 40 m tower consists of

11-8 panels x 5m height and it shall be truncated from the bottom to get 30m and 20 m towers.

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

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These three types of soils in dry conditions have safe bearing capacity as 200 KN/m<sup>2</sup>(min) for hard /rocky soil, 100 KN/m<sup>2</sup>(min) for medium soil and 60 KN/m<sup>2</sup>(min) for soft. Types of foundations:

No Water table: 50, 75, 100 & 150 KPa

Full Water table: 50, 75, 100 & 150 KPa

Standard tower design shall accommodate standard soil types for foundations

No water table : 50, 75, 100 & 150 kPa.

Full water table: 50, 75 , 100 & 150 kPa.

[Site specific foundation like plot constraints, pile foundations as per geotechnical recommendations.]

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. Base Plate & Anchor Bolts exposed to Environment shall be galvanized. Remaining part of anchor bolts should be painted with red oxide coating.

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. Site specific foundations like plot constraints, pile foundations as per Geotechnical recommendation.

Material :

M20 concrete shall be used. High strength Deformed steel bars of grade Fe415 conforming to IS: 1786(2008/1985) 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.

#### **2.4.1 Legs /Bracings**

## **2.4 super structure:**

Foundation material is

not in the scope of the tower supplier.

**Material** : ~~Angular Tower: MS angles of grade 'A' as per IS: 2062 (2011) and IS: 808 (2021). Tubes used for tower conforming to YST 240 or higher and YST-310 as per IS: 1161.~~

**Finish** : ~~All Structural Steel is MS angles are not to be hot dip galvanized as per IS: 4759.~~

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

#### 2.4.2 Gusset/splice plates

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

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

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IS: 4759(~~1999~~).

Standard Zinc for galvanizing should conform to IS: 13229(~~1991~~) or IS: 209(~~1992~~).

### 2.4.3 Nuts, Bolts & Washers

**Material** : For Angular Tower:  
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.

For Tubular Tower:  
Bolts are of Grade 8.8, Mating Nuts of Grade 8 and plain washers matching ~~equating~~ to high strength bolts.

**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. A gusset / connecting plate can be welded to tubular main leg members The design of tower members and joints is in accordance with the relevant provision in ~~BPS document~~ IS:800(~~2007~~1984). The connection between main leg member and bracing shall be bolted for angular sections. However, provision of welding a gusset / connecting plate to tubular main leg members can be kept for having bolted connection with the bracing member for flexibility in design

**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~~ for all the feeder cable runs at minimum 600mm each . width of ~~each~~ total rack shall be 550mm.

**4.0 Ladder** : A ladder shall be provided internal/externally as per manufacuter's design for the entire height of the tower. However purchaser or

procurement ~~or user~~ may specify the requirement of the ladder. Hoops and runners shall be provided to ensure the safety of the persons climbing the tower. Ladder width shall be min. 400mm, ~~450 mm~~.  
-The diameter of safety hoops shall be min. ~~600mm~~, ~~750mm~~.

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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).

:

6.0 Mechanical Requirements

6.1 The Ground Based Tubular Tower (GBT) shall be designed to withstand region-specific wind speeds derived from IS 875 (Part-3):2015. The earlier practice of applying a uniform 200 km/h design wind speed is replaced with zone-wise values to ensure structural optimisation and safety.

6.2 The design wind speed for different regions shall be as given below (However Purchaser or Procurer shall may specify the requirement):

Region Type	Maximum Basic Wind Speed as per IS: 875 (Part-3): 2015
Low-I	Up to 120 km/h
Low-Low-II	120-140 km/h
Medium-Medium-High	140-170 km/h
Non – Cyclonic/High	170-180 km/h
Cyclonic /Coastal	170-180 km/h (ka = 1.3)
Extremely High (Ladakh / Mizoram)	180-200 km/h

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\*Equivalent km/h values corresponding to IS 875 (Part-3) wind-zone classifications.

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Wind loads on the tower shall be evaluated in accordance with IS 875 (Part 3): 2015. For determine the design wind velocity, the structure shall be classified as per the risk categories specified in IS 17740:2022, and the corresponding design life shall be adopted as follows:

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Table: Design Life as per Risk Category (IS 17740:2022 – Clause 7.3.1)

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<u>Category</u>	<u>Design Life / Mean Probable Design Life</u>
<u>Category II</u>	<u>50 years</u>

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The basic wind speed, gust factor, shape factor, and exposed area of antenna microwave dishes, mounts, ladder cage, and cable trays shall be considered in the wind load calculations. Design wind pressures shall be taken from IS 875 (Part 3) and applied to all structural components and appurtenances.

6.3 The tower shall be capable of withstanding wind loads, dead loads, and antenna loads in accordance with IS

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17740:2022. Combined stresses shall satisfy the limit-state design criteria and partial safety factors specified in IS 17740:2022

6.4 The tower structure shall maintain serviceability:

1. 0.5 degree at 75% of basic wind speed.
2. Limit State of deformations as per mentioned in IS: 17740:2022.

6.5 All tower joints, members, and fasteners shall be designed to prevent loosening under cyclic wind loading conditions. Suitable vibration arresters or damping provisions shall be incorporated wherever required.

**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 provide. (Screened PVC insulated twin copper wire of size 3/22 IS mark with PVC conduit pipe IS mark to be provided by installer)

**8.0 Safety Requirements**

1.1 The Ground Based Tubular Tower (GBT) shall incorporate all safety provisions necessary for protection of personnel,

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nearby structures, and telecom equipment during installation, operation, and maintenance.

**1.2 Aviation Safety:**

The tower shall be equipped with aviation obstruction lights in accordance with the Directorate General of Civil Aviation (DGCA) guidelines. Aviation lights shall be installed at prescribed elevations and powered through a reliable supply with appropriate backup arrangements.

**1.3 Lightning Protection:**

Each tower shall be fitted with an air terminal (lightning finial) at the top, connected to down conductors and a properly designed earthing system. The earthing network shall comply with IS 3043, maintaining earth resistance values appropriate to site conditions.

**1.4 Earthing and Bonding:**

All metallic parts including tower legs, cable trays, mounts and accessories shall be electrically bonded and connected to the main earthing grid to eliminate potential differences and ensure personnel safety.

**1.5 Fall Protection:**

Ladders shall be equipped with safety hoops and/or certified fall-arrest systems to ensure safe ascent and descent during maintenance activities.

**1.6 Fencing and Access Control:**

A secure fenced enclosure with a lockable gate shall be provided around the tower base to prevent unauthorised access. The fencing height shall conform to site safety and operational requirements.

**1.7 Warning and Identification:**

The tower shall be painted in aviation red and white bands or as per DGCA visual marking norms. A durable identification plate showing tower type, height,

manufacturer's name, and year of manufacture shall be permanently fixed at the tower base.

**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 slant sloped -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.

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10.0 Testing Requirements

10.1 Destructive full scale testing of one prototype design to approve the design philosophies of proposed design.

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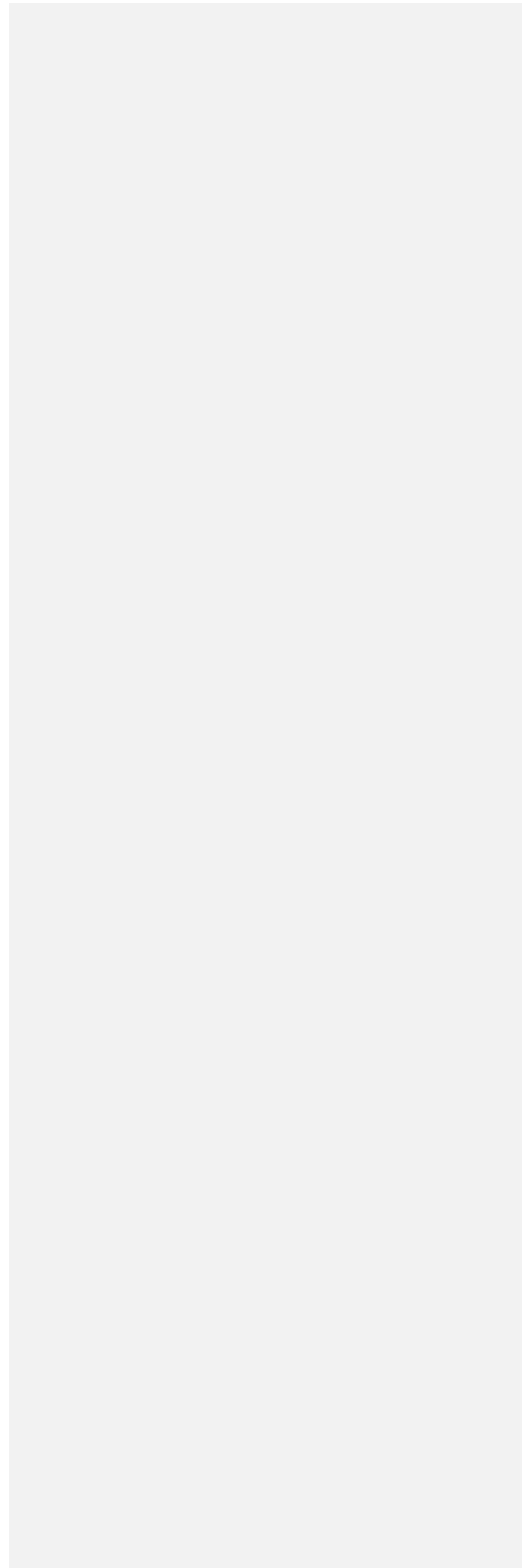
All tower designs must shall be approved by SERC. Foundation designs certified by SERC on generic foundations and site specific application of standard designs must be approved by Civil/Structural Engineer, Chartered Engineer or Profession Engineer.

10.2 The following minimum tests shall be conducted:

<u>Item</u>	<u>Requirement</u>
<u>Structural validation</u>	<u>As per IS 17740 – Verification of design strength and deflection limits</u>
<u>Galvanisation test</u>	<u>Zinc coating mass, thickness, and adhesion as per IS 2629 / IS 2633 , with measurements as per IS</u>

	<u>6745</u>
<u>Bolt torque test</u>	<u>Verification of torque values for all high-tension and critical bolted joints</u>
<u>Material test</u>	<u>Chemical and mechanical properties shall be confirmed for each steel grade used.</u>

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10.30 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 verticality limits are from transmission line towers and international telecom standards.

The verticality of towers shall be within the limits are given in IS: 5613 and IS: 12843.

(a) The tower shall not be out of vertical by more than 1 in 360.

(b) The horizontal distance between the vertical centre lines at any two elevations throughout the height of structure shall not exceed 0.25% of the vertical distance between the two elevations of latticed structure.

(c) Twist: The twist between any two elevations throughout the height of the structure shall not exceed 0.5 degrees in 3m. The maximum twist over the structure height shall not exceed 5 degree.

**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: 2007~~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

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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 & while 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.~~

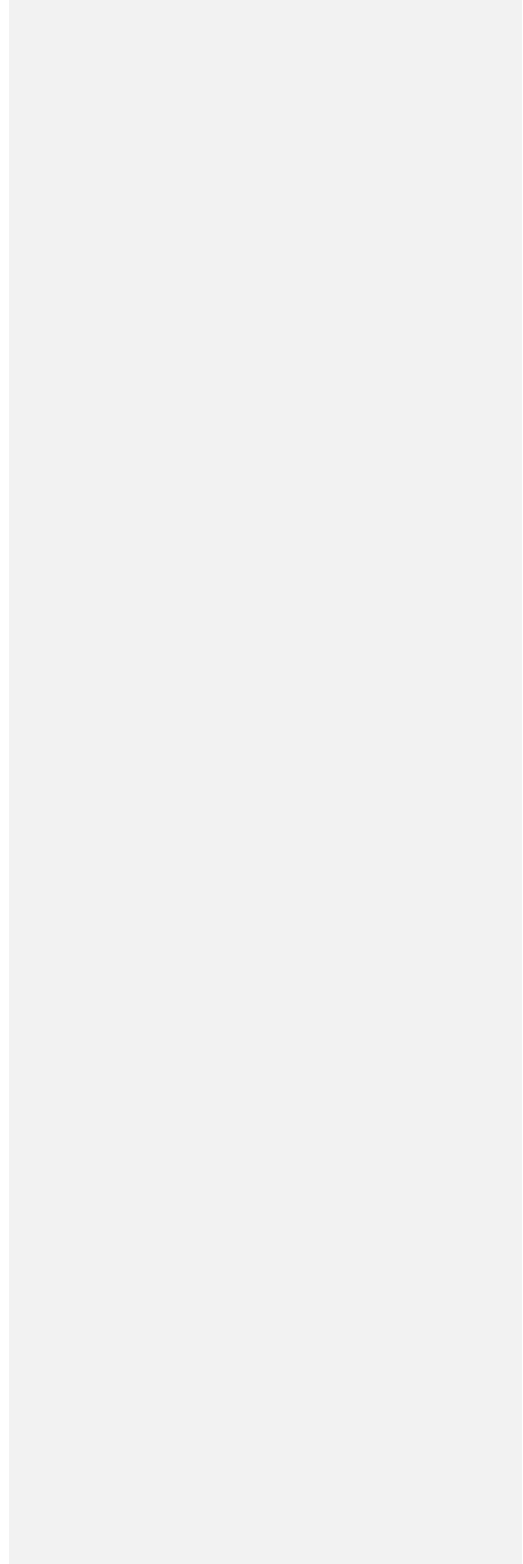
Technical literature in English with complete layout, detailed construction diagram and detailed block schematic wherever applicable shall be provided in hard copy. All aspects of installation, operation, maintenance, trouble shooting and replacement shall be covered in this manual. Additionally, a soft copy /QR code on the system in respect of technical literature shall also

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**16.0 Weight of tower \_\_\_\_\_ ;**  
**(Tolerance in weight : ± 3%)**

**40m 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) : 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 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) : 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

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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.

Platform type and Quantity to be decided based on proposed tower type.

~~No external platform needed as tower top width to be provided for internal climbing to be feasible. No external platform required if tower top width accommodates ladder & cable tray inside~~

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## 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.

3. Purchaser or procurer may specify the requirement of the external or internal ladder shall to be clearly mentioned at the time of ordering external or internal

4. purchaser or procurer may specify the Requirement of wind speed for design shall be specified by the Purchaser / Procurer.;

5. Antennae may be specified by Purchaser OR The Effective Projected Area (EPA) of Tower with Payload and peripheral accessories may be specified by Purchaser.

6. In the document, some features (which have been marked as per purchaser / procurer requirements) need to be examined by the purchaser / procurer and shall be suitably specified in the tender conditions / ordering information as per their requirement.

2.

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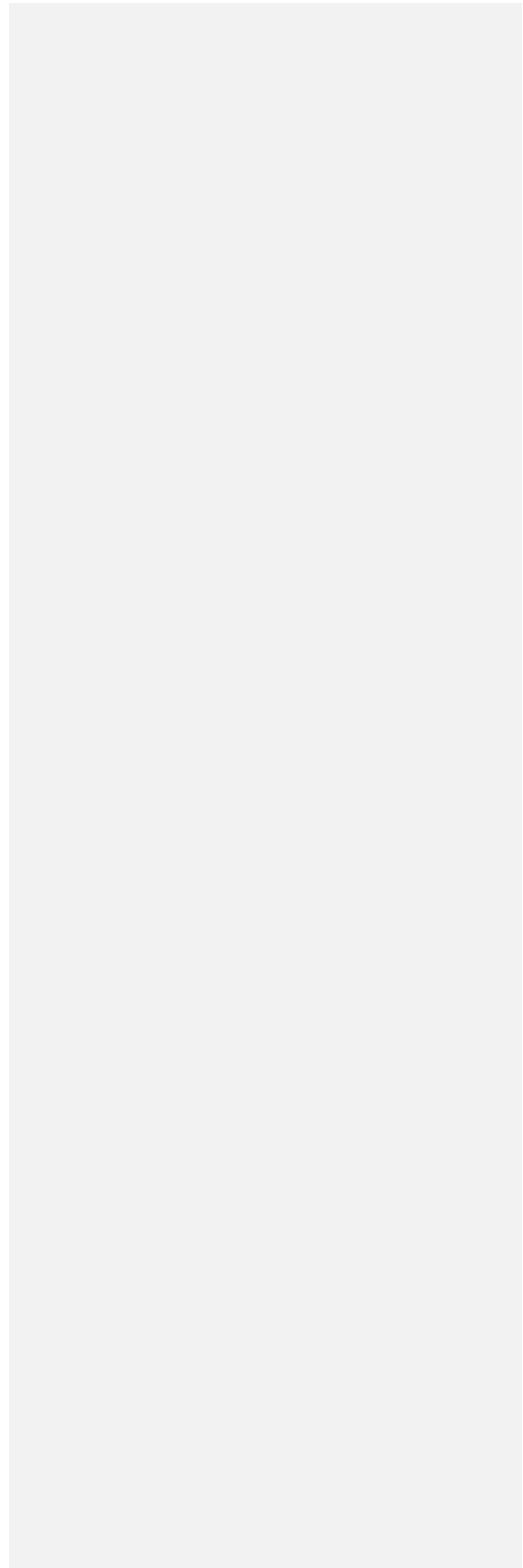
## ABBREVIATIONS

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	Galvanized 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 <sup>2</sup>	Kilo Newton per Meter Square Meter
M	Meter
Mm	Milimeter
m/s	Meter per second
MS	Mild steel
M20	Code Grade of Concrete
NB	Nominal Bore
PL	Plate (Mild steel)
P.C.C	Plane Plain Cement Concrete
PF	platform
REF	reference
R.C.C	Re-In Reinforced 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

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

DRAFT



Appendix 1

COMPONENT OF PENAL & 11 FOR 40 M NARROW BASE OWER										TYPE 40 HT		
REF. DEG. NO. - FABRICATION DETAIL-4												
MEMBER NO.	SECTION	SECTION			LENGTH (M)	UNIT WT. (KG/M)	QUAN-TITY (Nos.)	TOTAL WEIGHT (Kg.)				
		(mm)	(mm)	(mm)								
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		
<b>TOTAL=</b>										<b>2691.67</b>		

Appendix-I

COOMPONENT OF PENAL 8& 9 FOR 40 M NARROW BASE OWER										TYPE-40-IT	
REF. DEG. NO. - FABRICATION DETAIL-3											
MEMBER NO.	SECTION	SECTION			LENGTH (M)	UNIT WT. (KG/M)	QUAN-TITY (Nos.)	TOTAL WEIGHT (Kg.)			
		(mm)	(mm)	(mm)							
9L	ISA	120	X	120	X	12	5.006	22.40	4	462.56	
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	112.86	
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	22.45	
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	29.03	
9B-4	ISA	45	X	45	X	5	0.859	3.40	8	22.36	
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	
9L	ISA	120	X	120	X	10	5.006	19.70	4	394.47	
9D	ISA	65	X	65	X	6	5.767	5.80	8	267.59	
9H	ISA	45	X	45	X	5	1.420	3.40	6	28.97	
9H-1	ISA	45	X	45	X	5	1.420	3.40	2	9.66	
9B-1	ISA	45	X	45	X	5	0.735	3.40	8	19.99	
9B-2	ISA	45	X	45	X	5	1.437	3.40	8	39.09	
9B-3	ISA	45	X	45	X	5	1.341	3.40	8	36.48	
9B-4	ISA	45	X	45	X	5	0.735	3.40	8	19.99	
9PB	ISA	45	X	45	X	5	1.910	3.40	2	12.99	
9PB-1	ISA	45	X	45	X	5	1.910	3.40	1	6.49	
9PB-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	0.237	3.40	1	1.15	
9CR-1	ISA	45	X	45	X	5	0.297	3.40	1	1.01	
9CR-2	ISA	45	X	45	X	5	0.353	3.40	1	1.20	
9CL-1	ISA	45	X	45	X	5	0.288	3.40	1	1.32	
9CL-2	ISA	45	X	45	X	5	0.340	3.40	1	1.16	
SL-5	ISA	120	X	120	X	12	0.440	22.40	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	0.230	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	
<b>TOTAL</b>										<b>1977.95</b>	

Appendix I

COMPONENT OF PENAL 07 FOR 40 M NARROW-BASE-OWER										TYPE 40-IF	
REF-DEG-NO.-FEBRICATION DETAIL 2											
MEMBER NO.		SECTION					LENGTH (M)	UNIT WT. (KG/M)	QUANTITY (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	152.43	
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	
<b>TOTAL</b>									<b>1222.83</b>		

Appendix-I

COMPONENT OF PENAL 04 FOR 40-M NARROW-BASE LOWER										TYPE-40-III		
REF-DEG-NO-FEBRICATION-DETAIL-1												
MEMBER NO.		SECTION						LENGTH (M)	UNIT WT. (KG/M)	QUANTITY (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	15.60		
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	11.20		
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	68.40		
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		
									<b>TOTAL</b>	<b>800.44</b>		

Appendix-I

<b>(40 M HIGH TOWER, DETAIL OF PLATFORM)</b>										<b>TYPE 40-HT</b>	
MEMBER NO.	SECTION				LENG TH (M)	UNIT WT. (KG/M)	QUAN- TITY (Nos.)	TOTAL WEIGHT (Kg.)			
		(mm)	(mm)	(mm)							
<b>PLATFORM FOR GSM ANTENNA LVL 12 M FROM TOP</b>											
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	
<b>CHQD. PLATE</b>											
5CH-1	PL	1200	x	5	x		1.200	54.91	1	76.82	
5CH-2	PL	922	x	5	x		0.922	36.19	2	33.37	
5CH-3	PL	622	x	5	x		0.866	24.81	1	21.48	
5CH-3A	PL	622	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	
<b>PLATFORM FOR 0.6 M DIA ANTENNA LVL 7.5 M FROM TOP</b>											
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	PL	45	x	5	x		1.410	1.77	1	2.49	
<b>CHQD. PLATE</b>											
3CH-1	PL	1094	x	5	x		1.094	42.94	1	46.98	
3CH-2	PL	703	x	5	x		0.703	27.59	2	19.40	
3CH-3	PL	416	x	5	x		0.670	16.33	1	10.94	
3CH-3A	PL	416	x	5	x		0.670	16.33	1	10.94	
3CH-4	PL	460	x	5	x		0.765	18.06	1	13.81	
3CH-4A	PL	460	x	5	x		0.765	18.06	1	13.81	

Appendix I

(40-M-HIGH-TOWER, DETAIL OF PLATFORM)								TYPE-40-IT		
MEMBER NO.	SECTION						LENGTH (M)	UNIT WT. (KG/M)	QUANTITY (Nos.)	TOTAL WEIGHT (Kg.)
	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)				
<b>PLATFORM FOR GSM ANTENNA LVL 125 M FROM TOP</b>										
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	14.62
1PF-3	ISA	55	X	55	X	5	2.072	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	2.072	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	11.64
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	PL	45	X	5	X		1.080	1.77	4	7.69
1PF-19	ISA	45	X	45	X	5	1.080	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	PL	45	X	5	X		1.110	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	1.110	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
<b>CHQD. PLATE</b>										
1CH-1	PL	1399	X		5	X	1.399	54.91	1	76.82
1CH-2	PL	932	X		5	X	0.932	26.19	2	33.37
1CH-3	PL	632	X		5	X	0.666	24.81	1	21.48
									<b>TOTAL</b>	<b>1017.91</b>
<b>(40-M-HIGH-TOWER, DETAIL OF LADDER, SHEET NO-6)</b>								<b>TYPE-40-IT</b>		
MEMBER NO.	SECTION						LENGTH (M)	UNIT WT. (KG/M)	QUANTITY (Nos.)	TOTAL WEIGHT (Kg.)
	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)				
LR										
B/C	ISA	50	X	50	X	5	0.150	3.80	2	1.14
B	ISA	45	X	45	X	5	0.797	3.40	2	4.81
C	RUNG	16	DIA				0.458	1.60	3	2.20
<b>11LR TO 6LR</b>										
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			2.297	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			3.050	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	22	93.86
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
									<b>TOTAL</b>	<b>639.98</b>

Appendix I

<b>(40-M HIGH TOWER - DETAIL OF CABLE RACK, SHEET NO-6)</b>							<b>TYPE-40-III</b>			
MEMBER NO.	SECTION	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		
							<b>TOTAL</b>	<b>205.52</b>		
<b>BASE PLATE FOR 40 M. TOWER</b>							<b>SHEET NO-4</b>			<b>TYPE-40-III</b>
MEMBER NO.	SECTION	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	4	85.63		
							<b>TOTAL</b>	<b>347.45</b>		
<b>LIGHTING ARRESTER PAD</b>							<b>SHEET NO-1</b>			<b>TYPE-40-III</b>
MEMBER NO.	SECTION	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	
							<b>TOTAL</b>	<b>2.85</b>		
<b>VIAION LAMP PAD</b>							<b>SHEET NO-1</b>			<b>TYPE-40-III</b>
MEMBER NO.	SECTION	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	
							<b>TOTAL</b>	<b>4.20</b>		

Appendix-I

DETAILS OF FOUNDATION BOLTS											
MEMBER NO.	SECTION				LENGTH (M)	UNIT WT. (KG/M)	QUANTITY (Nos.)	TOTAL WEIGHT (Kg.)			
	(mm)	(mm)	(mm)	(mm)							
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			
							<b>TOTAL</b>	<b>304.73</b>			
NUTS & BOLTS											
MEMBER NO.	DESCRIPTION OF MEMBER	SECTION				LENGTH (M)	UNIT WEIGHT (KG/M)	QUANTITY (Nos.)	TOTAL WEIGHT (Kg.)		
		mm									
1	NUTS & BOLTS	12 mm dia				0.030	0.058	160	9.20		
2	NUTS & BOLTS	12 mm dia				0.035	0.062	245	15.10		
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				0.060	0.167	120	18.84		
8	NUTS & BOLTS	16 mm dia				0.065	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	
								<b>TOTAL=</b>	<b>374.27</b>		
SUMMARY FOR 40 M NARROW BASE TOWER											
					WEIGHT	TYPE-40HT					
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					
<b>TOTAL</b>					<b>40548</b>	<b>KG</b>					

Appendix II

COMPONENT OF PENAL 8& 9 FOR 40-M NARROW-BASE OWER										TYPE-40-IFT	
REF. DEG. NO. - FABRICATION DETAIL 3											
MEMBER NO.	SECTION	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	112.86	
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	12.82	
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	23.26	
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	
9L	ISA	130	X	130	X	10	5.006	19.70	4	394.47	
9D	ISA	65	X	65	X	6	5.767	5.80	8	267.59	
9H	ISA	45	X	45	X	5	1.420	3.40	6	28.97	
9H-1	ISA	45	X	45	X	5	1.420	3.40	2	9.66	
9B-1	ISA	45	X	45	X	5	0.735	3.40	8	19.99	
9B-2	ISA	45	X	45	X	5	1.437	3.40	8	39.09	
9B-3	ISA	45	X	45	X	5	1.341	3.40	8	36.48	
9B-4	ISA	45	X	45	X	5	0.735	3.40	8	19.99	
9PB	ISA	45	X	45	X	5	1.910	3.40	2	12.99	
9PB-1	ISA	45	X	45	X	5	1.910	3.40	1	6.49	
9PB-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	0.255	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	0.237	3.40	1	1.15	
9CR-1	ISA	45	X	45	X	5	0.297	3.40	1	1.01	
9CR-2	ISA	45	X	45	X	5	0.252	3.40	1	1.20	
9CL-1	ISA	45	X	45	X	5	0.388	3.40	1	1.32	
9CL-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	

Appendix-II

COMPONENT OF PENAL 07 FOR 40-M NARROW-BASE LOWER										TYPE-40-III	
REF. DEG. NO. - FABRICATION DETAIL 2											
MEMBER NO.	SECTION	SECTION			LENGTH (M)	UNIT WGT. (KG/M)	QUANTITY (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	
5L-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	
6C	PL	112	X	6	X		0.254	5.28	8	10.72	
<b>TOTAL</b>										<b>1323.83</b>	

Appendix-II

COMPONENT OF PENAL 04 FOR 40-M NARROW-BASE LOWER										TYPE-40-III		
REF-DEG-NO-FEBRICATION-DETAIL-1												
MEMBER NO.		SECTION						LENGTH (M)	UNIT WT. (KG/M)	QUANTITY (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	15.60		
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	11.20		
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	68.40		
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		
									<b>TOTAL</b>	<b>800.44</b>		

## Appendix-II

(40 M HIGH TOWER, DETAIL OF PLATFORM)										TYPE-40-IIT	
MEMBER NO.	SECTION	SECTION						LENG TH (M)	UNIT WGT. (KG/M)	QUAN- TITY (Nos.)	TOTAL WEIGHT (Kg.)
		(mm)		(mm)		(mm)					
<b>PLATFORM FOR GSM ANTENNA LVL 12 M FROM TOP</b>											
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	
<b>CHQD. PLATE</b>											
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	
<b>PLATFORM FOR 0.6 M DIA ANTENNA LVL 7.5 M FROM TOP</b>											
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	9.95	
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	PL	45	X	5	X		1.410	1.77	1	2.49	
<b>CHQD. PLATE</b>											
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

<b>(30M HIGH TOWER, DETAIL OF PLATFORM)</b>										<b>TYPE-40-III</b>			
MEMBER NO.	SECTION	SECTION			LENGT H (M)	UNIT WT. (KG/M)	QUAN-TITY (Nos.)	TOTAL WEIGHT (Kg.)					
		(mm)	(mm)	(mm)									
<b>PLATFORM FOR GSM ANTENNA LVL 2.5 M FROM TOP</b>													
1PF-1	PL	55	X	55	X	5	1.027	4.10		8	33.69		
1PF-2	ISA	100	X	100	X	8	0.160	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		
<b>CHOD. PLATE</b>													
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		
										<b>TOTAL</b>	<b>1017.91</b>		

Appendix II

(40 M HIGH TOWER, DETAIL OF LADDER, SHEET NO-6)							TYPE-40-III			
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	14.21
LC-2	PL	40	X	6			0.186	1.88	15	5.26
								<b>TOTAL</b>		<b>639.98</b>
(30 M HIGH TOWER, DETAIL OF CABLE RACK, SHEET NO-6)							TYPE-40-III			
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
								<b>TOTAL</b>		<b>150.72</b>

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	254	X	40		0.090	19.70	8	14.19			
	PL	254	X	40		0.110	19.70	8	17.34			
	PL	254	X	40		0.163	19.70	4	12.85			
	PL	130	X	130	X	12	0.598	4	55.97			
								<b>TOTAL</b>	<b>238.82</b>			
<b>LIGHTING ARRESTER PAD</b>							<b>SHEET NO.1</b>		<b>0</b>			
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	160	X	6			0.150	1	1.21			
								<b>TOTAL</b>	<b>3.21</b>			
<b>AVIATION LAMP PAD</b>							<b>SHEET NO.1</b>		<b>0</b>			
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			
								<b>TOTAL</b>	<b>4.20</b>			
<b>DETAILS OF FUNDATION BOLTS</b>												
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			
								<b>TOTAL</b>	<b>229.29</b>			
<b>NUTS &amp; BOLTS</b>												
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
										<b>TOTAL=</b>	<b>259.44</b>

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	
					<b>TOTAL</b>	<b>7280</b>	<b>KG</b>

Appendix III

COMPONENT OF PENAL 07 FOR 40 M NARROW-BASE OWER										TYPE 40-IF		
REF. DEG. NO. - FIBRICATION 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		
5L-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		
5L-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		
5L-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		
5L-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
<b>COMPONENT OF PENAL 04 FOR 40-M NARROW BASE COWER</b>										<b>TYPE-40-IT</b>	
REF. DEG. NO. - FABRICATION DETAIL-1											
MEMBER NO.		SECTION					LENGTH (M)	UNIT WT. (KG/M)	QUANTITY (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	4.69	
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	
<b>TOTAL</b>										<b>800.44</b>	

Appendix III

(20-M-HIGH-TOWER, DETAIL OF PLATFORM)										Type 40-III		
MEMBER NO.	SECTION				LENGTH (M)	UNIT WGT. (KG/M)	QUAN-TITY (Nos.)	TOTAL WEIGHT (Kg.)				
		(mm)	(mm)	(mm)								
<b>PLATFORM FOR 0.6 M DIA ANTENNA LVL 7.5 M FROM TOP</b>												
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		0.180	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	PL	45	X	5	X		1.410	1.77	1	2.49		
<b>CHQD. PLATE</b>												
3CH-1	PL	1094	X	5			1.094	42.94	1	46.98		
3CH-2	PL	703	X	5			0.703	27.59	2	10.40		
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		
<b>(20-M-HIGH-TOWER, DETAIL OF PLATFORM)</b>										<b>TYPE 40-III</b>		
MEMBER NO.	SECTION				LENGTH (M)	UNIT WGT. (KG/M)	QUAN-TITY (Nos.)	TOTAL WEIGHT (Kg.)				
		(mm)	(mm)	(mm)								
<b>PLATFORM FOR GSM ANTENNA LVL 1.5 M FROM TOP</b>												
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	2.072	4.10	1	12.10		
1PF-4	ISA	45	X	45	X	5	0.796	3.40	3	8.12		
1PF-5	ISA	55	X	55	X	5	2.072	4.10	4	12.10		
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	6.41		
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	6.18	16	8.29		
1PF-17	PL	45	X	6	X		0.121	2.12	8	2.05		
1PF-18	PL	45	X	5	X		1.080	1.77	4	7.69		
1PF-19	ISA	45	X	45	X	5	1.080	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	PL	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-26	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		
<b>CHQD. PLATE</b>												
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		
<b>TOTAL</b>										<b>736.61</b>		

(40-M-HIGH-TOWER, DETAIL OF LADDER, SHEET NO-6)							TYPE-40-IFT			
MEMBER NO.	SECTION	SECTION			LENG TH	UNIT WT.	QUAN- TITY	TOTAL WEIGHT		
		(mm)	(mm)	(mm)					(M)	(KG/M)
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	4.84
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			2.050	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	6.34
LC-2	PL	40	x	6			0.186	1.88	6	2.40
									<b>TOTAL</b>	<b>346.63</b>
(20-M-HIGH-TOWER, DETAIL OF CABLE RACK, SHEET NO-6)							TYPE-40-IFT			
MEMBER NO.	SECTION	SECTION			LENG TH	UNIT WT.	QUAN- TITY	TOTAL WEIGHT		
		(mm)	(mm)	(mm)					(M)	(KG/M)
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	6.94
4CR										
A	PL	50	x	5			4.994	1.96	2	19.60
B	PL	40	x	5			0.550	1.57	8	6.94
CL	PL	40	x	5			0.146	1.57	6	1.38
									<b>TOTAL</b>	<b>96.78</b>
<b>BASE PLATE FOR 40-M. TOWER</b>				<b>SHEET NO.4</b>			<b>TYPE-40-IFT</b>			
MEMBER NO.	SECTION	SECTION			LENG TH	UNIT WT.	QUAN- TITY	TOTAL WEIGHT		
		(mm)	(mm)	(mm)					(M)	(KG/M)
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
									<b>TOTAL</b>	<b>144.33</b>

LIGHTING ARRESTER PAD							SHEET NO.1			TYPE-40-IT			
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	±	2.60			
B	PL	50	X	6	X		0.160	2.36	±	0.36			
										<b>TOTAL</b>	<b>2.85</b>		
AVIATION LAMP PAD							SHEET NO.1			TYPE-40-IT			
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	±	2.15			
B	PL	160	X	6			0.160	7.54	±	1.21			
CP-14	PL	50	X	6			0.184	2.36	±	0.85			
										<b>TOTAL</b>	<b>4.20</b>		
DETAILS OF FUNDATION BOLTS													
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				
									<b>TOTAL</b>	<b>92.40</b>			
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	210	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			
									<b>TOTAL=</b>	<b>193.79</b>			
SUMMARY FOR 20 M NARROW BASE TOWER													
	WEIGHT OF PENE	5 TO 7				=	1344						
	WEIGHT OF PENE	4 TO 4				=	800						
	WEIGHT OF PLAT FORM					=	737						
	LADDER					=	347						

