

**India's Tallest  
Flag mast: 63 M**



Our experienced Project Engineers from E&P BU design and execute all types of Highmast Lighting Installations on a turnkey basis for you in a most economical manner. E&P BU also under takes turnkey Lighting Installations and Electrical Power Distribution jobs involving design, supply, installation and commissioning for Power Stations, Steel Plants, Fertilizer Plants, Petro Chemical Plants, Airports, Public Lighting, Stadium Lighting and other varieties of projects.

Our LDMS has one of the most modern R&D Laboratory, recognized by the Ministry of the Science & Technology, Government of India. It is capable of providing all types of computerized photometric data for development of new luminaries and also for illumination design through use of a photogonio meter.

In house 3D solid modelling facility enables design, simulate and develop state of the art high mast accessories and also custom made designs for special applications like Umbrella mast, Flag mast; Lighting & Advertising etc;

The Quality Control Department continuously tests and monitors the use of right materials, the processes and finishes. This ensures adherence to strictly defined standards of quality by Bureau of Indian standards and International Electro Technical Commission on illumination. Samples are periodically tested in our lighting application laboratory. The lab is equipped with the latest measuring and testing equipment Electrical, Mechanical, Thermal, Environmental, Optical and CAD facilities to check compliance with safety requirements.

Lighting is an art which no computer or machine can even master. Our expert experienced Lighting Design Engineers provide cost effective and energy-saving illumination designs with the help of in-house computer-aided lighting design facility. They also provide technical services for solving all types of lighting problems choosing the right products for varied applications.

We undertake to design the lighting levels as per the specifications and also demonstrate the same at work site. Our lighting design is presented in several forms such as horizontal luminance (most commonly used), vertical luminance, glare calculations, and lighting levels at the position of TV camera or luminance. This can be shown on a site plan as a grid of values or contour lines. Our schemes not only show lighting levels but also give details of luminaries used, height and the direction of the same.



## Sales Enquiry

We request you to write / email us for design / offer with proposed location of installation, soil data and Layout drawing in AutoCAD with proposed locations clearly marked and purpose of illumination, preferred light source, maintenance factor etc;

Specifications and features shown are standard and will vary depending on the scope of order. Further due to continuous development and improvement the data may change.



# High Mast Lighting



*Designed, Engineered, Manufactured  
and Erected by Bajaj*

# HIGHMAST

## Introduction

Bajaj Electricals Limited (BEL) is part of 'bajaj' group founded almost a century ago by Late Jamnalal Bajaj, a well known Indian freedom fighter and a visionary and the group is among the top 10 business houses in the country with a combined group turnover in excess of 3 billion USD.

Engineering & Projects BU of BEL is in High Mast Business since 1983 and have installed over 20000 high masts ranging from 10 m to 63 m height at various parts of India and abroad for illumination, signage, telecommunication, transmission, flag installations. Over the period we have grown consistently and have set up facilities for design, development, manufacture, erection, testing, commissioning and servicing of the high masts. Our structural designs are validated at IIT, Mumbai and Chennai, EIL, NTPC, PGCIL, CPWD, Bechtel, PDIL, Toyo and many other Government and Private institutions. We are the only company to have in-house capability and facility for civil, structural & illumination design, development of accessories. At our manufacturing unit at Ranjangaon near Pune, we have International level CNC controlled machines and state of the art radio remote radio controlled Galvanising plant. We have teams of Engineers for marketing, execution and after sales service at 19 branches situated all across India and a branch office in middle east.



## Applications

- Area Lighting
- Airports
- City Junction
- Toll Plaza
- Sea Ports
- Car Park
- Sports Stadium
- Telecommunication Monopole
- Transmission Monopole
- Flag Mast
- Signage Mast
- Hoarding Mast
- Traffic Signal Mast

## Specification

### MAST STRUCTURE

Mast shafts are hot dip galvanized, continuously tapered of polygonal cross section presenting a good and pleasing appearance.

### DYNAMIC LOADING

The mast structure is designed as per TR No.-7 of Institution of Lighting Engineers of UK and are suitable to sustain an assumed maximum reaction arising from a wind speed (three second gust) as laid down by IS: 875/1987 (Part III) measured at a height of 10 metres above ground level. Wind excited oscillations are damped by the method of construction and adequate allowance is made for the related stresses. Stress analysis calculations are provided against specific request. The mast section is wind tunnel tested at Wichita University, Kansas, USA for using the correct force coefficient in structural calculations. Structural design is validated by type testing the full size mast and pole at Jyoti Ltd and SERC, Chennai.

### MAST CONSTRUCTION

High mast shaft is fabricated from high tensile steel plates conforming to BS EN 10025 or equivalent having minimum yield strength of 355 N/ mm formed in polygonal shape and fillet welded and other components as per IS 2062. Detailed procedures and procedure qualifications are as per AWS Section D 1.1 & of Clauses 20 and 21 of BS5135.

A Vandal and weather proof door with provision to padlock is provided to have clear access to the base compartment equipments like winch, motor, cable, termination etc. The base flange welded to high mast shaft develops full strength of the section. In addition supplementary gussets are provided between the bolt holes.

The mast is delivered to site in sections and are joined by stressing equipment, thus forming a sleeve joint. Site joints or welded joints are neither required nor desirable.

# LIGHTING

### METAL PROTECTION

The entire fabricated mast is hot dip galvanized, internally and externally as per BS EN ISO 1461 or equivalent.

### RAISING LOWERING ARRANGEMENT

The proven In-Tension design is provided comprising winch, head frame and stainless steel wire ropes.

### HEAD ARRANGEMENT

Cast Aluminium pulley suitable for trailing cable and wire ropes are with bush bearing and stainless steel spindle provided with guides, separator and adjusters to prevent ropes and cables leaving their respective pulley grooves.

Pulley assembly is housed in a chassis integral with a sleeve which slips over the top of the mast and is secured axially and azimuth. Guides and stops are provided for docking of luminary's carriage. The complete fabricated assembly and canopy covering the pulley assembly is hot dip galvanized.

### WINCH

Winches are completely self sustaining with out the need of any break/spring/clutch, self lubricating by means of oil bath, worm gear driven of ratio 53:1, grooved drums for tidy and smooth rope lay. Special termination arrangement of rope does not involve distortion of the ropes. The winch is designed to install or remove through the mast door.

Name plate is provided giving the details of type of winch, SWL, operating speed and year of manufacturing and instruction plate for the type of the lubricant. Our winches have been type tested through IIT as consultant for SWL from 350 to 1500 Kg.

### STAINLESS STEEL WIRE ROPE

Stainless steel wire ropes in grade 304 or 316 in flexible 7/19 construction (central core is also of same material) of various diameters to have factor of safety more than 5 specified in the TR No-7. Ropes for 2 wire rope, DD type winches have both ends with factory fitted talurit and thimble and copper crimping. For SGDD and 2/3 rope system joints at carriage end are fitted at site.

### WINCH OPERATING POWER TOOLS

Integral or external (single phase or three phase) power tools are available for the operation of winch. Both Integral as well as external power tools incorporate mechanical torque limiter for safety of equipments. Suitable arrangements to couple the integral power tool and support the external power tool are provided. Provision is available to lower the luminary's carriage manually by handle. We suggest final docking the lantern carriage by handle.

### LUMINARIES CARRIAGE

The standard luminary's carriage in two halves is of welded construction fabricated from durable round steel tube for aerodynamic effect and to act as conduit with holes in bottom side to take the wiring flexible cable. Arms with circular profile for mounting luminaries are welded to the ring. HDG clamps with S.S hardware are provided to mount the CG boxes and balance the weight on carriage to avoid eccentric load. Legs are welded to anchor the wire rope for 2 or 3 ropes.

### LIGHTENING FINIAL & EARTH TERMINAL

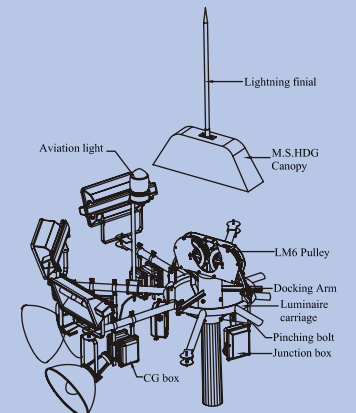
Provision is given on canopy to fix the hot dip galvanized lightning finial fabricated out of ERW tube. Two number 12 mm diameter galvanized bolt with nut and washers are fixed on door stiffener to terminate the earth flat from earth pit.

### FOUNDATION BOLTS

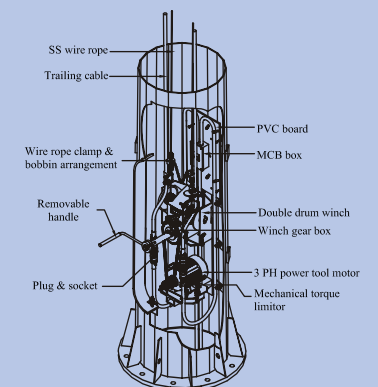
Hot dip galvanized (exposed portion) high tensile studs are supplied with nuts; washer and anchor plate to cast in to the foundation is supplied for each mast. Common template is provided for precisely setting the bolts.

### MAINTENANCE CAGE (OPTIONAL)

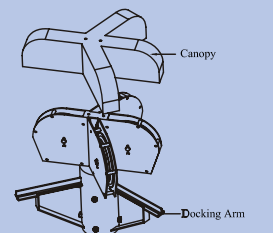
Hot dip galvanized maintenance cage is designed to carry two persons with maintenance equipment to do maintenance at mast head or for painting of the mast for special applications. Suspension ropes have safety factor of more than 10 (Supply of maintenance cage is against separate order only).



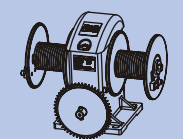
**Mast Head Assembly With 2 Rope Head Frame**



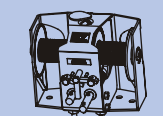
**Base Compartment With DDMFO Type Winch**



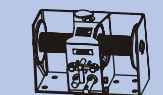
**3 Rope Head Frame**



**SGDD Type Winch**



**DDMFO Type Winch**



**DDMFO Type Winch**