JOLLY ELECTRICALS PVT. LTD.

TECHNICAL SPECIFICATIONS – HIGH MAST (14 Mtrs. & 16 Mtrs).

MAST STRUCTURE

The high Mast shall be of continuously tapered, polygonal cross section polygon type (**Minimum 16 - Sides)** of 14 Mtrs. & 16 Mtrs. in height presenting good visual appearance and shall be based on proven design to given assured performance, reliability and service. The Mast shall have an approximate top diameter of say 150 mm to 200 mm and bottom diameter of 350mm to 450mm. The weight of the Mast shall not exceed more than 1600 kgs. excluding weight of Luminaire, to maintain good elasticity of slender structure.

MAST CONSTRUCTION:

The Mast shall be fabricated from special steel plates of **BS EN 10025 grade,** cut and folded to form polygonal section and shall be telescopically jointed and fillet welded. The welding shall be in accordance with BS : 5135. The procedural weld geometry and the workmanship shall be exhaustively tested by the radiography on the completed welded and certificates submitted.

The Mast shall be delivered **in only 2 sections without any circumferential welding** at site, which shall be joined together by slip-stressed-fit method. The joining shall be with stressing equipment, thus forming the sleeve joint. No site welding or bolted joint will be accepted. The overlap distance shall have full penetration of longitudinal welds. The base plate of the mast shall be **atleast 25mm.** thick. An adequate door opening of **min. 1400 mm x 300 mm** shall be provided at the base of each Mast. The opening shall be such as to permit clear access to equipment like winches, cable pug and socket, etc. The opening shall be complete with a close fitting vandal resistant, weather- proof door provided with a heavy duty lock. For metal protection of the Mast, the entire fabricated Mast shall be not dip galvanised internally and externally, having minimum average thickness of 65 microns.

DYNAMIC LOADING:

The Mast structure shall be designed for an assumed maximum reaction arising from the maximum win speed (3 seconds gust) and measured at a height of 10 Mtrs. above ground level as per IS 875, Part III, 1987. The design life of the Mast shall be min. 25 years. Wind excited oscillation shall be damped by the method of constructions and adequate allowance made for the related stresses. The offered High Mast shall be a tested design.

FOUNDATION:

The tenderer shall see the site closely and minutely with regard to the nature of the soil, average depth of decomposed garbage and debris at proposed Mast locations and the other site conditions before working out the type of foundation and specifications for the proposed High Mast.

The tenderer shall be responsible for the design of the foundation and safe erection and installation of the High Mast in mechanically and structurally safe working condition for the design life of the Mast. The load bearing (safe) capacity of the soil shall be indicted by purchaser to decide the type of foundation and its specifications. The holding down bolts shall be **atleast 20 nos.** of high tensile strength and shall be supplied complete with anchor plate of 6 mm thick for

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casting into the foundation. The precision made steel template with tube holes shall be provided to ensure correct verticality and horizontality of bolt alignment.

LANTERN CARRIAGE:

The fabricated lantern carriages shall be provided for holding the floodlight fittings and control gear provided on each High Mast. The lantern carriage shall be of special design and of durable steel tube construction designed to act as electric conduit with cable holes fully protected by grummets. The diameter of the lantern Carriage shall be suitabe so as to hold designed number of floodlight fittings, as specified in the tender design along with the control gear boxes and lantern.

The lantern carriage shall be fabricated in **three parts** joined by bolted flanges with SS bolts with nuts to enable easy removal from the erected mast for replacement/ maintenance purpose. The carriage shall be supported / suspended by **three wire ropes** for better stability. The lantern carriage Assembly shall not touch the lower surface of the Mast. The carriage design and fabrication shall be such that the lantern carriage will suit the lanterns and their control gear boxes to be used in the work.

The Lantern Carriage shall be so installed that it does not cause any damage to the surface of the Mast and is provided with protective buffer arrangement. The complete Lantern Carriage shall be hot dip galvanised after fabrication.

The weather – proof cast aluminum junction boxes (IP-55) shall be provided on the Lantern Carriage assembly from which the inter – connections will be made to the designed number of floodlight fittings and lanterns on the carriage.

MECHANICAL ARRANGMENT:

For installation and maintenance purpose, it will become necessary to raise or lower the lantern carriage assembly. To enable this, a suitable winch arrangement shall be provided in the base of the Mast, complete with top pulley, winch stainless steel wire ropes and winch driving power tool.

A: WINCH:

The winch shall be of completely self – sustaining type. The winches shall be of self – sustaining type by means of an oil bath and the lubrication shall be of recommended quality. Termination of the ropes of the winch shall be in such a way, that it does not involve distortion or twisting of the rope configuration. At least 6 turns of rope shall remain in tension on the drum even when the lantern carriage is fully lowered. The winch shall be designed to be installed or removed form the door opening at the base of the mast. The winch drums shall be grooved to ensure mechanically strong, stable and tidy rope lay with no chances of rope slippage or skippage. The winch shall be capable of operation by hand or by means of external power tool. Integrated power tool with worm is not acceptable.

A test certificate shall be supplied along with each winch in support of the maximum load operated by the winch and for the safety of operation at the full load rotation. A handle shall also be provided for hand operation of the winches.

B : TOP PULLEY ASSEMBLY :

The top pulleys shall be of a diameter, appropriately large enough to accommodate the steel wire ropes and the muiticore electric cable. The material of construction of the pulley

blocks shall be non – corrosive and made of dia cast (LM - 6) aluminum alloy. The pulley assembly shall be complete with self lubricating bearing and stainless steel spindle.

C : STAINLESS STEEL WIRE ROPES :

Stainless steel wire ropes shall be of 7 / 19 construction of 6 mm diameter, having a breaking load of not less than 2400 kgs. Complete with stainless steel thimbles. The end for connection to the winch drum shall be fitted with thimbles and the thimbles shall be secured by copper compression splices.

CABLE AND CABLE CONNECTIONS:

The connections shall be made with flat core flexible round sheath power cables of appropriate rating as per the schedule. The base compartment of the High Mast shall have one terminal box for terminating the incomer cable. The maintenance cables equal to that within the Mast and fitted with a 5 core plug socket shall be provided to energise lanterns while in lowering position by hooking up at the base compartment socket supply.

Similarly, the provision shall be made for electric supply at the base compartment to enable operation of the external power tool for lowering or rising of the lantern carriage assembly. The trailing cables of the lantern carriage rings shall be terminated by means of metal cased plug and socket provided in the base compartment to enable flexibility.

WINCH DRIVING POWER TOOL :

The electric driven tool shall be single speed, (1.2 Mt./min.) reversible three phase & hand operated motor. The power tool shall be complete with very robust remote control switch such that the tool can be operated from safe distance of 5 Mtrs. There shall be an arrangement for self alignment off power tool which can be self supported during operation. Manual handle shall be provided for hand operation of the winches. The capacity rating and speed of the electric motor used in the power tool shall be specified by the tenderers.

LIGHTNING FINIAL & AVIATION OBSTRUCTION LIGHTS:

One number heavy duty hot dip galvanized lighting finial shall be provided for each mast. Suitable Aviation Obstruction Lights of reliable design and reputed manufacturer shall be provided on top of each mast.