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ANNEXURE-I

Tender No. : DID2288P07/GC
Tender Date : 08.08.2006

Item No./ Mat. Code	Material Description	Quantity	UOM
10 0C000264	<p>Supply, erection, testing & commissioning of 30 Meters of Hihjmast Lighting system with 12nos. of 2x400 watt metal halide fittings with Non integral control gear box with details of specifications are given below:</p> <p>TECHNICAL SPECIFICATIONS OF 30 MTRS HIGH MAST LIGHTING SYSTEM</p> <p>1.0 MAST:</p> <p>1.1 The high mast shall be continuously tapered, polygonal cross section and 30 meters high. The mast shall be fabricated from steel plate welded construction in suitable number of sections (not less than 3), telescopically jointed giving a continuous tapered profile and presenting good visual appearances.</p> <p>1.2 Mast sections material shall conform to IS 226 - 1975.</p> <p>1.3 The mast sections are hot dipped galvanized both inside and outside conforming to IS: 4759-1984, IS: 2629-1985, IS: 2633-1072.</p> <p>1.4 Mast structure shall be designed to withstand wind velocity of 180km/hr. with 3 sec. gust conforming IS: B75 part VIII - 1987 and should have wind load factor 1.25 and material factor 1.15.</p> <p>1.5 The base flange shall be provided with gusset and high tensile anchor bolts.</p> <p>1.6 The bottom most section shall accommodate winch electric drive, cable, plug/socket etc. with a proper door opening in order to permit clear access to the above components. The door shall be dust proof; vermin proof and weather protected (IP 55) and shall be provided with suitable locking arrangement.</p> <p>1.7 Mast shall be provided with lightning protection.</p> <p>1.8 Provisions for suitable Earthing shall be provided.</p> <p>1.9 The mast shaft shall be made with best steel in compliance with BS EN 10025 FE 510 having the guaranteed characteristics.</p> <p style="margin-left: 20px;">a. Minimum yield strength = 335 N/Sq. mm for thickness < 30mm. b. Tensile strength ranging from 340 to 470 N/sq. mm. c. Minimum elongation for thickness between 3 mm and 30 mm. d. All holding bolts are hot dip galvanized to BS 729.</p> <p>2.0 LANTERN CARRIAGE</p> <p>2.1 The lantern carriage shall be of steel tubular ring type construction designed to accommodate 12 Nos. of HPMH flood light luminaries with</p>	3	NO

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	<p>necessary C.G. Box in and radically symmetrical fashion.</p> <p>2.2. The complete lantern carriage assembly shall be hot dip galvanized after fabrication.</p> <p>2.3 The carriage shall have proper arrangement to avoid swing and to prevent damage to mast surface or other installed parts during lowering/raising operation of carriage.</p> <p>2.4. All hardware used shall have necessary corrosion protection.</p> <p>2.5 Lantern Carriage/Accessories shall be made with best steel in compliance with BS EN 10025 FE 430 A or equivalent having the following guaranteed characteristics.</p> <p>a. Minimum yield strength 225 to 250 N/Sq. mm for thickness < 30mm b. Tensile strength ranging from 340 to 470 N/Sq. mm. c. Minimum elongation 23 to 26%.</p> <p>3.0 WINCH ASSEMBLY:</p> <p>3.1 Winch assembly, meant for hoisting of lantern carriage shall be fixed in the base of the mast and shall have provision to operate both manually and electrically. The double drum winch should be suitably designed to handle the total weight of lantern carriage assembly with all fittings and accessories with required factor of safety.</p> <p>3.2 The winch shall be of self sustaining and self lubricating type with positive locking arrangement. The rope drum is fabricated as per IS-807 and the wire rope is wound/unwound on double drum winch during movement of lantern carriage.</p> <p>3.3 Particular care shall be exercised in all aspects of design, manufacture, and testing and installation arrangement of the system to ensure optimum safety under all operating condition to give a minimum 25 years of operating life.</p> <p>3.4 Test certificates shall be provided with each winch stating clearly the capacity, operating lubricant, speed and recommended lubricant.</p> <p>3.5 The material of construction for top pulley block shall be non corrosive and preferably made of die cast LM-6 aluminum alloy with self lubricating bearing.</p> <p>3.6 The design shall ensure that the operation of pulley is maintenance free Pulley should be provided with a weather proof cover.</p> <p>4.0 WIRE ROPE:</p> <p>4.1. The wire ropes are flexible marine grade and non corrosive stainless steel.</p> <p>4.2. A minimum 8 turn of wire ropes shall be on the drum when the lantern carriage is fully lowered.</p> <p>4.3. The stainless steel wire is of minimum 6mm diameter, 7x19 constructions which shall have a factor of safety not less than 5 times the safe working load (SFL) of winch.</p> <p>5.0 WINCH DRIVING POWER TOOL:</p>		

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	<p>5.1 The winch drive unit shall be squirrel cage reversible induction motor with following characteristic: 415V, 3 phase, 50 HZ Class F insulation Weather resistant IP 55 Protections, Make- Crompton Greaves/ Kirloskar Ltd/ Siemens/ Bharat Bijlee</p> <p>5.2. The capacity of the electric motor used in power tool shall be compatible to handle the design load of lantern carriage.</p> <p>5.3 The power tool shall be housed at the base of the mast.</p> <p>5.4 For safety reasons and final precision docking of lantern carriage ring, the power tool must have provision to operate manually by using external crank device without removing the drive motor from the winch unit.</p> <p>6.0 CONTROL PANEL (FEEDER PILLAR BOX)</p> <p>6.1. A feeder pillar box made of 14 SWG CRCA sheet metal, self supporting, floor mounted, dust, vermin and weather proof for outdoor use shall be supplied for locally/automatically switching' ON/OFF of luminaries. The control panel comprises the following.</p> <p>6.2. 63 Amps, TPN fuse switch unit as incomer. Make: Havells/GEC Alsthom/Siemens.</p> <p>6.3. 32 Amps TPN fuse switch unit as isolator for motor. Make: Havells/GEC Alsthom/Siemens.</p> <p>6.4 Earth leakage Relay with core balance transformer Sensitivity: 30 MA to 2A, Time delay: 0 - 2 sec. Make: Merlin Gerlin/ MDS Legrand</p> <p>6.5. 32 Amps triple pole AC 3 duty power contactor with 230V operating coil. Make: Siemens/Telemmchanique</p> <p>6.6. Digital Voltmeter & Ammeter , size-96mm X 96mm, AE make. Range 0-600V, Current transformer with CT ratio-50/5 Make- Konzerv / AEI Ltd</p> <p>6.7. Start/Stop push button for locally switching ON/OFF the luminaries - 1 set.</p> <p>6.8. NS 4 type fuses carrier and base for control circuit.</p> <p>6.9. Automatic lighting Switch with digital time switch of rail mounting suitable for astronomical calculations of sun rise and sun set by setting date, time and positions of longitude and latitude, model-Rex-2000, asrto-time -switch, 230V AC, 50HZ, Make- MDS legrand/ equivalent.</p> <p>6.10. Suitable MCB for switching ON/OFF the motor and 2Nos.suitable contactor for forward and reversing operation.</p> <p>6.11. Detachable gland plate and copper brought out terminals for incoming and outgoing cable connection</p> <p>6.12. Feeder Pillar box to be painted with by 2 coats of primer followed by epoxy grey paint.</p> <p>6.13. Push button for raising and lowering the mobile part shall operate on "Dead man# principal i.e. action shall cease as soon as the button is released.</p> <p>6.14. Feeder Pillar should be located 5meters radial distance from high mast.</p> <p>6.15. A single line diagram for Feeder Pillar shall be submitted along with the offer.</p>		

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	<p>7.0 LUMINARIES:</p> <p>7.1. 12 nos. of non-integral type, Metal halide flood light luminaries similar to MNT 001/FHD132A of Phillips/ Crompton & Greaves, Make with 2 X HPI T400W/2 X MH (T) 400W lamps or equivalent complete with control gear box with all accessories. The Ballast shall be Electronic ballast and degree of protection of the light fitting shall be IP65., Make-Philps/ Crompton Greaves/ Bajaj Electricals/ GE Lighting/ Equivalent 2Nos. 3core, 10sqmm, copper conductor, flexible screen cable, 1100V grade, Make- Nicco/ Incab / Polycab /Finolex shall be used from lantern carriage to winch driving power tools.</p> <p>8.0. EARTHING:</p> <p>8.1. The mast shall be provided with lightning protection system comprising of an Earthing system as follows: 50mmdia, 3 meters Long G.I Pipe with bricks enclosures and cover - 4Nos. 35mm X 6mm G.L straps for interconnection of stud at mast 2nos.earth electrodes for lightening arrester and 2Nos. earth electrodes for earthing system of high mast lighting system.</p> <p>9.0 TOOL BOX:</p> <p>9.1 A tool box of sheet steel containing a set of general and spcial purpose tools is to be supplied along with high mast.</p> <p>10.0. AVIATION OBSTRUCTION LIGHTS & LIGHTENING ARRESTER</p> <p>10.1 Medium intensity LED aviation obstruction light similar to neon spiral type fitted in a weather- proof box on body unit of Aluminium alloy shall be supplied. The cover of the light will be glass with rubber gasket (IP55 protection). High Luminosity flashing red light emitting diodes having life of 11 years. Power consumption 10 to 15 Watts, 230V AC, 50HZ, 90 candela. LED#s are mounted on fire retardant epoxy printed circuit board in five series- parallel circuits.-1Set Make- Binay Opto Electronics Pvt. Ltd./Bajaj Electricals Ltd/ Philips.</p> <p>10.1 Lightning protection shall be provided on the top of the high mast. 10.2 Lightening arrester shall be connected to 2nos. of Earth electrode.</p> <p>11.0. FOUNDATION:</p> <p>11.1 Foundation of high mast shall be grillage type considering the Earth Quake resistance measure and party shall have to design and furnish the foundation of High mast along with the offer. 11.2 The bearing capacity of the soil shall be 10 T/m 2</p> <p>12. GENERAL CONDITIONS:</p> <p>12.1 Supply, erection, testing and commissioning, including civil foundation jobs, of high mast to be done by the party at OIL#s LPG Recovery and Filling Plant. The civil jobs of the foundation of the high mast shall be done by the party after approval of foundation drawing by OIL. All the materials for foundation shall be supplied by the party including metallic items like site</p>		

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	<p>bolts, anchor plate, steel template etc.</p> <p>12.2 All necessary arrangements for erection of mast are to be made by the party including supply of all safety appliances and tools to workman.</p> <p>12.3 Transportation of men and materials to the site will be party's responsibility and M/S. Oil India Limited will not provide any transport or transferring of man and materials to the site.</p> <p>12.4 The persons who are authorized to carry out electrical works should have electrical supervising license and work permit as per I.E. Rules.</p> <p>12.5 For installation, testing and commissioning of mast, party should have electrical license valid for Assam.</p> <p>12.6 The party should submit detailed schedule of program of work within 15 days from the award of order.</p> <p>12.7 The whole work should be completed within 10 month from the date of issue of order to the entire satisfaction of Engineer-in-charge of OIL.</p> <p>12.8 The party will be responsible for their tools, tackle and materials and personnel at site till the towers are finally handed over to OIL.</p> <p>12.9 The party will take all safety measures during the execution of the work. OIL will not compensate to the party in any way for any loss of man and material.</p> <p>12.10 If due to improper execution of the work or due to negligence on the part of the party's workmen, OIL's property is damaged, the parties will compensate for the loss.</p> <p>12.11 The party will submit six set of operation and maintenance instruction manual and on site drawings of all the components of mast.</p> <p>12.12 All the works shall be carried out as per relevant codes, practices rules and regulations. The workmanship will be of very high standard.</p> <p>12.13 Party shall make its own arrangement for boarding and lodging of their working personnel.</p> <p>12.14 The work shall be carried out under direct supervision of the party. The party shall submit monthly progress report of work to the Engineer-in-charge in writing.</p> <p>12.15 If the job is not completed in the stipulated time, the contractor shall be penalized at the rate of 0.01% of the unfinished job per month.</p> <p>12.16 Any deviation shall be clearly spelled out along with the offer.</p> <p>12.17 Non-destructive test as per relevant standard shall be carried out on the Flange Plate and test certificate will be submitted to OIL.</p> <p>12.18 Verticality and straightness measurement shall be carried out and these should be within the limits as specified in TR No.7.</p> <p>12.19 A separate test certificate of the winch shall be submitted.</p> <p>12.20 Supplier's Test Certificate shall be submitted for each reel of rope.</p> <p>12.21 Test certificate of chemical composition and mechanical properties of Sheets and Flange Plates shall be submitted as per the relevant Standards.</p> <p>12.22 Test certificate of Head Frame Assembly, Mast sections, Trailing cable and cable connector as per relevant standards shall be submitted.</p> <p>12.23 Welding and Fabrication detail shall be submitted to OIL. These should be as per relevant standard Rules, Regulations and practices.</p> <p>12.24 Principles and details of joints shall be shown on drawings which will be submitted immediately after placement of order.</p> <p>12.25 The thickness of internal and external galvanization shall be as per B5729 and a test certificate shall be submitted confirming the same.</p> <p>12.26 Detailed dimensional drawing of the complete Mast including the dimensional details of Base door opening, the distance from the Mast Flange plate to the bottom of the door etc. should be submitted after placement of</p>		

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	<p>purchase order.</p> <p>12.27 A drawing with details of Head Frame Assembly complete with Pulley, Guides, Ropes, covering to stop access of birds or other objects/rains etc. and power wiring arrangement should also be submitted after placement of purchase order.</p> <p>12.28 Heat resisting cable shall be used between lamp holders and circuit connection points. Manufacture#s Test Certificate as per relevant standard shall be submitted after placement of order.</p> <p>12.29 Type of light distribution diagram will be submitted immediately after placement of purchase order.</p> <p>12.30 The workmanship throughout shall be of a high standard and materials new and of the best quality shall be supplied.</p> <p>12.31 All components shall be designed to require the minimum of maintenance and skilled attention and also to allow routine maintenance to be carried out quickly and easily with a minimum use of tools.</p> <p>12.32 Every reasonable precaution and provision shall be incorporated in the design of the equipment for the safety and security of the system and of those concerned with its operation and maintenance.</p> <p>12.33 The electrical installation shall comply of all appropriate statutory requirements, rules, regulations, standards and practices.</p> <p>12.34 All metal work including luminaries, control gear units and luminaries carriage shall be bonded to the earth core of the luminaries supply cable. The earth continuity from luminaries# carriage shall be via a single core of the multi-core cable.</p> <p>12.35 The Mast shall be ventilated. Details by means of which this is achieved shall be submitted after placement of order.</p> <p>12.36 The average rate of raising and lowering shall be not less than 3 meters per minute. Initial supply of oil for winch shall be given by the party.</p> <p>12.37 Crane services will be provided by OIL for lifting of 30 meters High mast.</p> <p>12.38 Details of foundation, design calculations of foundations of High mast, catalogue of High mast and luminaries with photometric data and illumination level at every 10meters for area of 200 meters X 200 meters keeping the mast at the center shall be provided by the party.</p> <p>12.39 Quotation along with RCC foundation details, design calculations of foundation of high mast, catalogue of high mast and luminaries, illumination level chart should be sent for technical scrutiny. Offer without any of these documents will be liable for rejection.</p> <p>12.40 High mast and accessories with fitting will be inspected by OIL#s, Engineer at the premises of supplier before dispatch.</p> <p>12.41 Payment terms- 70% the values of the order against supply of items and balance 30% payment after successful installation, testing and commissioning of all high mast.</p> <p>12.42 Party should submit credential to establish that they have executed successfully supply, erection, testing and commissioning of similar type of high mast in at least two reputed organizations. Performance certificate of satisfactory completion of jobs from those organizations shall be submitted.</p> <p>12.43 Test certificate of steel plate, anchor plate, wire rope, and Drum winch shall be furnished along with quotation.</p> <p>12.44 Party should fill up the Data sheet as per Annexure-II failing which offer is liable for rejection.</p> <p>12.45 Party should quote separately for radiographic test of the High mast.</p> <p>12.46 High mast should be designed to have maintenance free life of 25years</p>		

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	<p>and should be guaranteed for a period of 25 years against any manufacturing / design defects.</p> <p>12.47 High mast lighting structure will be installed in hazardous installation like LPG Recovery and filling Plant at the proximity of LPG Filling and Storage areas.</p> <p>12.48 The construction of high mast must be of suitable design such that it can withstand the abnormal climatic condition which is normally encountered in this part of the country. It may also be noted that the location comes under Seismic zone v i.e. Earth quake prone area.</p> <p>12.49 Accordingly supplier must ensure that the high mast is of reputed and established make taking care of safety factors mentioned above.</p>		

Special Notes : (1) To evaluate the inter-se ranking of the offers, Assam Entry Tax on purchase value will be loaded as per prevailing Government of Assam Guidelines as applicable on bid closing date. Bidders may check this with the appropriate authority while submitting their bids.