

Design of Mobile Light Tower (MAST)

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Abstract— This project involves the designing of Mobile Light Tower Mast. The scope of the project is design mobile light tower mast to illuminate a relatively large area. High-mast lighting towers are used which are vertical, cantilevered structures using CAD technique. Especially where large areas are to be illuminated without the need for numerous lighting columns that under certain circumstances high mast lighting towers are preferred over conventional lightning. The project involves the detailed study and getting the information from the sources available about mobile light tower. On the basis of data accumulated CAD model will be developed. This project is based on the requirement of the mobile light tower mast at the time of night or when the day is smaller than night, this lights are used to provide light.

Key words: CAD Model, MAST, IMD Stations

I. INTRODUCTION

High mast lightning towers are often used to provide lighting for areas around freeways and interchanges. These steel poles are fabricated in segments that are galvanized to improve the long-term corrosion performance.

High-mast lighting towers are vertical, cantilevered structures that are used to illuminate a relatively large area. Although primarily used for highway intersection lighting in rural areas, they are also utilized in other large areas such as parking lots, sporting venues, or even penitentiaries. The portable lighting towers are used for many different purposes. They are especially used in construction and are better known as construction light towers. The need for light towers significantly increases during the months when days are shorter.

The geometry of the poles is dependent on the height requirements as well as the design wind speed, and cantypically vary from 100' to 175' and can hold a variety of lamp configurations.

High-mast lighting towers have several distinct features. The towers consist of a single sectioned tube connected to a flat base plate. Base plates range from 1.5-in to 4-in in thickness. The base plate is bolted to a foundation that extends several feet into the ground. Illumination comes from a lighting apparatus located at the top of the tower. The towers are adaptable to two types of luminary systems: systems with lowering devices and fixed mounted configurations.

II. DATA ACCUMULATION

All design data related to the dimensions, cross sections, material of mobile light mast tower, number of lights to be installed on light mast, height of mobile light tower will be accumulated from the company and sources available. Dimension of truck body will also be accumulated to design the body on which light mast and D.G. set will be installed with the help of measuring devices, all the essential

measurements will be taken to generate CAD model of Light mast tower.

4 Nos 400W Metal halide lamp (White light) to be provided for above lighting fixtures for optimum flicker free beam spread and maximum area coverage suitable for operation with 240VAC, 50Hz supply. The luminaries should work normally in 220- 240 VAC range, i.e., Voltage & Frequency range generated by DG set. The lumen output of lamps shall be 30000 lumens minimum (Lumens after 100 burning hours).

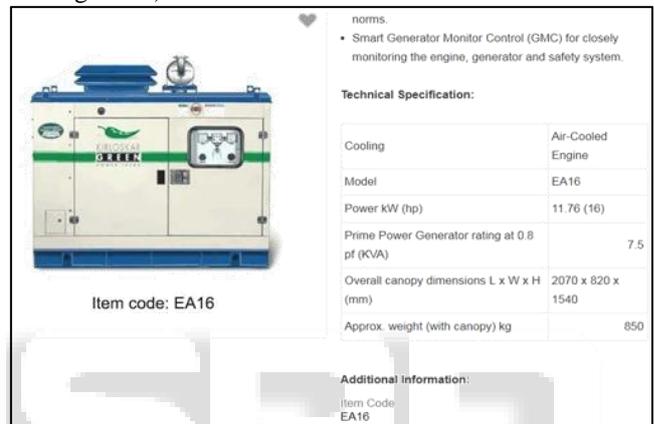


Fig.2.1: Technical Specification of Generator

Table 1. Statistics of daily gust wind data at IMD stations in India

IMD station	Total no of records	Available number of years of maximum gust wind speed	Raw hourly gust statistics (Figure 1)					Up-cross peak statistics (Figure 2)			
			W _{max} kmph	W _{mean} kmph	W _{std} kmph	Extreme kmph	Number of peaks	EP-mean kmph	EP-Std kmph	Extreme P kmph	
											A
HASHIMARA	2882	9	125	31	13	72	1386	24	15	68	
MADRAS_HARBOUR	6177	20	150	42	13	81	3045	35	17	85	
TUTICORIN_HP	5275	15	140	51	14	94	2833	47	16	95	
MANGALORE_HP	1451	4	91	38	13	76	761	35	12	70	
AMRITSAR	11099	32	190	37	19	94	5921	31	17	82	
PALAM_A	12626	35	199	39	15	85	6792	34	14	78	
NEWDELHI_SAFRIG	12310	34	152	35	15	79	6457	30	14	71	
CHABUA_A	395	2	72	28	12	65	155	16	15	60	
JAIPIUR_SANGANER	11697	38	181	32	15	76	6148	27	14	70	
LUCKNOW_AMAUSI	7160	18	170	39	16	87	3637	33	16	81	
BAGROGA_A	2921	9	102	31	13	70	1448	24	15	68	
ALLAHABAD_BAMHRAULI	863	3	131	31	14	73	452	27	13	65	
VARANASI_BABATPUR	539	2	67	25	9	52	277	21	9	49	
GAYA	2207	7	120	34	16	83	1163	29	16	76	
NEW_KANDLA	7407	22	132	47	15	91	3989	43	15	88	
AHMEDABAD	9652	29	150	35	11	69	5019	31	12	68	
BHOPAL_BAIRAGARI	7784	22	125	42	14	83	4158	38	13	78	
JAMNAGAR_A	4328	15	182	44	13	83	2209	38	16	86	
BARODA	7354	22	155	35	13	72	4052	31	13	70	
INDORE	6959	21	136	52	13	91	3704	47	15	92	
JAMSHEDPUR_PB	1395	4	118	34	18	89	730	29	16	78	
JAMSHEDPUR	1284	4	122	36	17	87	646	30	17	79	
KALAIKUNDA_A	2336	8	142	40	17	91	1283	33	18	87	
CALCUTTA	6074	18	143	40	16	88	3133	35	16	82	
CALCUTTA_DUMDUM	9966	29	200	34	17	83	5272	29	15	75	
NAGPUR_ONEGAON	9348	26	132	36	15	81	5013	32	14	74	
RAIPUR	6442	22	112	28	13	67	3443	24	12	61	
JHARSUGUDA	1216	4	120	37	17	89	657	32	16	80	

Table. 2.1: Statistics of daily gust wind data at IMD stations in India

III. CAD MODELING

Cad Model of the Leaf spring testing machine designed as per the design calculations presented in the previous article

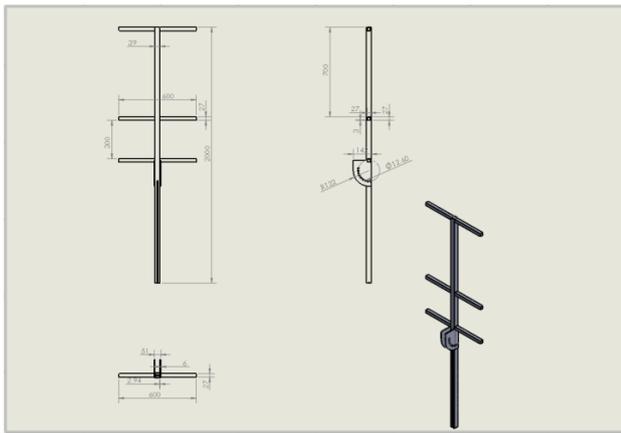


Fig. 3.9: Detailed View of upper portion of Tower

IV. CONCLUSION

The main objective of mobile tower mast is to design a mobile light pole tower for mining industry and to design the truck body to carry DG set (Generator) and light pole tower. The need for light towers significantly increases during the months when days are shorter. These portable light towers enable workers to complete their tasks even after sun sets. Aside from providing needed visibility, light towers also reduce safety risks of workers being injured and prevent major accidents which can sometimes end badly. Generated the CAD model of mobile light tower mast in CAD software and achieved more light and comfortability as it is easy to move from one place to another.

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