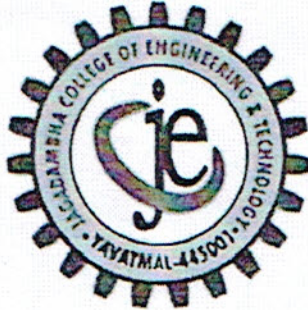


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DEPARTMENT OF MECHANICAL ENGINEERING



CERTIFICATE

This is to certify that the project report entitled "Performance Analysis of Heavy Duty Vehicle King-Pin Using CAD Tool" has been successfully completed by Miss. Trupti Yogeshwar Galat under the guidance of Prof. A. M. Shende in recognition to the partial fulfillment for the award of the degree of Master of Engineering in Mechanical Engineering at "Jagadamba College of Engineering & Technology, Yavatmal - 445001. (An institution affiliated to Sant Gadge Baba Amravati University, Amravati).

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## Abstract


King-Pin plays an important role in steering, suspension and stability mechanism of any heavy duty vehicle like truck, bus, containers etc. Tyre inclination angles are set with respect to King-Pin only, which directly affect tyre life. King-Pin is a connecting media between excel and wheel. Turning of wheels, balancing etc. are the important functions of King-Pin.

As it needs to work in tough conditions hence it is made up with tough metals like high carbon steel, chromium steel etc. Still there are few issues with the life of pin and improper lubrication of King-Pin bushings can cause King-Pin contact points to begin to wear at the steering knuckle. You will notice signs of King-Pin and bushing failure from incorrect vehicle alignment, premature and uneven front tire wear, and rough handling. Experiencing these symptoms while driving may result in a shaking cab or steering wheel. Because of the potential for further damage and operator safety risks, properly diagnosing and repairing worn King-Pins, bushings and tie rods needs to be addressed promptly.

In this project the King-Pin is to be redesigned and strength performance is to be carried out by using manual calculation method and CAD/CAE tools. In manual calculation method the all design parameters are inspected and redesign of King-Pin is done with proper designing formulas. CAD model is developed by using reverse engineering process and further strength performance is carried out on CAD model in CAE tool like ANSYS 14.5. Also the role of vibration is to be checked. By studying all generated results conclusion will be drawn.

**Index Terms-** Strength performance, CAD/CAE Tool, ANSYS 14.5, King-Pin



  
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CERTIFICATE

This is to Certify that the project report entitled "Air Flow Analysis of Solar Air Heater Using CFD Tool" has been successfully completed by Mr. Abhiraj Shantaram Chavhan under the guidance of Prof. A. B. Dhumne in recognition to the partial fulfillment for the award of the degree of Master of Engineering in Mechanical (CAD/CAM) at "Jagadambha College of Engineering & Technology, Yavatmal - 445001. (An institution affiliated to Sant Gadge Baba Amravati University, Amravati).

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## Abstract

In Solar Air Heater, collector plate is the important component which is mainly responsible for heat transfer through convection. Attached ribs to the collector plate will also improve the thermal efficiency of the solar air heater. It is also proved with an experiment that the rate of heat transfer can be also increased by using variety of ribs. Perforated ribs can give better heat transfer rate as compared with flat collector plate. But the limitation of solar energy i.e. fluctuation in intensity and availability in days only narrows the use of solar air heater. A better solution of use of solar panel to charge battery and use it further in night for heating of collector plate could be done. This arrangement will give hot air in night also. Performance of solar air heater is same as we got in day condition if we maintain required collector plate temperature.

In this project, the phenomenon of air heating is studied and well described by computational fluid dynamic method (CFD). For this purpose the ideal solar air heated chamber is modeled in CAD software like CATIA V5R19 and then further imported into CFD tool like ANSYS Fluent 14.5. The inlet and outlet boundary conditions are given in such a way that, it will simulate actual physical conditions. The rate of heat exchange, Temperature contours, Pressure and velocity counters are observed well to generate proper conclusion.

**Index Terms** – Solar Air Heater, Perforated Ribs, Collector Plate, CATIA V5R19, CFD Tool



  
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CERTIFICATE

This is to Certify that the project report entitled "Vibration Analysis of Windmill Blade By Using CAD And FEA Tool" has been successfully completed by Mr. Kamlesh Hemant Pendle under the guidance of Dr. V. L. Bhambere in recognition to the partial fulfillment for the award of the degree of Master of Engineering in Mechanical Engineering at "Jagadamba College of Engineering & Technology, Yavatmal - 445001. (An institution affiliated to Sant Gadge Baba Amravati University, Amravati)

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## Abstract


Windmill blades are very important energy generation point of view. They are totally responsible for the rotational movement which produces electricity. The failure of any windmill blade leads to drop in energy generation and malfunction in windmill. Hence proper care, maintenance, and regular checkup of windmill blades are always carried out. These blades are also subjected to vibrations due to the unbalancing, failure from any edge or high speed rotation. Some windmills are having three blades and some may have more than five. Depending on the location, wind speed and energy requirement, type of windmill along with blades is selected.

Normally windmill fails due to the high speed wind flow. This high speed wind creates pressure on windmill which is beyond sustainable range some times. Hence failure accurse. In fact vibrations will be generated. Vibrations are counted in the form of frequency (Hz). As we know that, more the frequency, safer the object. Therefore the value of frequency in case of windmill blade must be greater. Natural frequency value must be greater with possible deformation.

In this project the windmill blades are examined vibrating point of view. The entire study is concentrated on the effect of vibrations on the windmill blade and its behavior due to vibrations. For that reason the windmill with 18 blades is taken into consideration. Entire windmill blade geometry is modeled on CATIA software which is further imported into ANSYS 14.5 FEA package to perform vibration analysis. Based on generated results, conclusion is drawn.

**Index Terms-** CAD, CAE Tool, Vibration Analysis, Shape Optimization



  
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CERTIFICATE

This is to certify that the thesis entitled **EXPERTIMENTAL STUDY OF SEISMIC EFFECTS ON THE RCC FRAMED STRCTURE BY PROVIDING SHEAR WALL & TUBE SYSTEMS**, which is being submitted to Sant Gadge Baba Amravati University, Amravati for the award of degree of **Master of Engineering in Civil Engineering (Structural Engineering)** is the result of bonafied research work completed by **Rasheed Ullah Khan Sharique Ullah Khan** under my supervision and guidance. The matter embodies in this thesis is original and has not been submitted for the award of any other degree or diploma.

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## ABSTRACT

As the rate of growth of population is increasing day by day, the requirement of land is increasing for different purposes. To accommodate this increased population, the height of building is increasing thereby subsequently increasing the importance of lateral load resisting system which provide adequate strength against lateral loading arising due to earthquake and wind. In present study various lateral load resisting system have been introduced which can resist the lateral forces and safely transfer them to soil thereby improving the strength and stiffness of column structures. The lateral load resisting systems that are widely used are conventional beam column system, shear wall system, tube system, outrigger system, tubular system etc. An exhaustive study has been performed on the performance beam column system, shear wall system and tube system of 12 storey RCC building with plan size 18 m × 18 m using ETAB software. All structural members are designed as per IS 456:2000 and all the load combinations of seismic forces are considered as per IS 1893(Part 1): 2002. Finally, Parameter such as storey displacement, storey drift, storey stiffness and time period are compared and obtained results were presented in both graphically and tabular format.

Keywords - Shear wall system, Tube system, Beam Column System, High rise building, Storey displacement, storey drift storey stiffness and Time period.

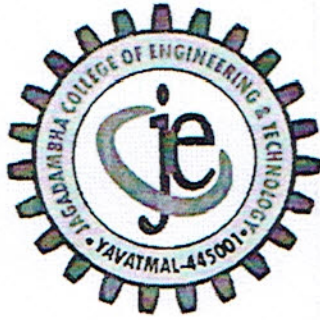


  
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CERTIFICATE

This is to certify that the thesis entitled "Experimental Investigation On Masonry Wall To Construct Earthquake Resisting Structure", which is being submitted to Sant Gadge Baba Amravati University, Amravati for the award of degree of Master of Engineering in Civil Engineering (Structural Engineering) is the result of bonafied research work completed by Mr. Sagar B. Bhong under my supervision and guidance. The matter embodies in this thesis is original and has not been submitted for the award of any other degree or diploma.

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## ABSTRACT

Natural calamities such as tsunami, landslide, and earthquake etc, various structures get disturbed and lead to loss of life and property damage. So to overcome these damages we are studying earthquake resisting masonry wall structure.

Half scale clay bricks are produce in same manner as a large scale bricks to investigate the suitability of the masonry wall using half scale clay bricks. Binding wire used holds the structure in place and provides strength and ductility to structure. Binding wire resist vibration during earthquake.

Experimental work is carried out by using different models on instrument which is known as shake table for vibration effect and behavior of models up to failure under compressive load .this study plays important role in construction of earthquake resisting structure .this technique will be revolutionary in construction technology.

*(Key Words: Brick Masonry, Shake Table, Compression Test Machine, Half Scale Bricks,)*



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