“Design of HVAC system using Solar Energy and Natural Convection”

Submitted in partial fulfilment of the requirements of the degree of

Bachelor of Engineering

by

MR. MUDDASSIR HABSI

MR. ABDULLA KAZI

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Under the guidance of

PROF. AMEY S. WAGH

Department of Mechanical Engineering
M.H.SAB00 SIDDIK COLLEGE OF ENGINEERING
8, SABOO SIDDIK POLYTECHNIC ROAD,
MUMBAI-400 008 (2018-19)

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CERTIFICATE

This is to certify that project entitled **"Design Of HVAC System Using Solar Energy And Natural Convection"** is a bonafide work of **"Mr. Muddassir Habsi, Mr. Abdulla Kazi, Mr. Arbaz Khan and Mr. Abdul Mukit Sarwar"**submitted to the University of Mumbai in partial fulfillment of the requirement for the award of the degree of Undergraduate in Mechanical Engineering.

(Prof Amey S Wagh)
Project Guide

Dr. Javed H. Shaikh
Head of Department

Dr. Ganesh kame
Principal

Project Report Approval for B. E.

This project report entitled **"Design of HVAC system using Solar Energy and Natural Convection"** by **Mr. Muddassir Habsi, Mr. Abdulla Kazi, Mr. Arbaz Khan and Mr. Abdul Mukit Sarwar** is approved for the degree of Mechanical Engineering.

Examiners

1.----------

2.----------

Date:

Place:

Declaration

I/we declare that this written submission represents my ideas in my own words and where others' ideas or words have been included, I/we have adequately cited and referenced the original sources. I/we also declare that I/we have adhered to all principles of academic honesty and integrity and have not misrepresented or fabricated or falsified any idea/data/fact/source in my submission. I/we understand that any violation of the above will be cause for disciplinary action by the Institute and can also evoke penal action from the sources which have thus not been properly cited or from whom proper permission has not been taken when needed.

(Signature) (Mr. Muddassir Habsi (ME115018))

(Signature) (Mr. Abdulla Kazi (ME115027))

(Signature) (Mr. Arbaz Khan (ME115031))

(Signature) (Mr.Abdul Mukit Khalid Hasan Sarwar) (ME115051)

Date:

ACKNOWLEDGEMNT

The success and outcome of this project required a lot of guidance and assistance from many people and we are extremely privileged to have got this all along the progress of our project. All that we have done is only due to such supervision and assistance and we would not forget to thank them. We owe our deep gratitude to our project guide ER. AMEY WAGH who took keen interest on our project work and guided us all along the progress of our project work by providing all the necessary information for developing a good project.

We are thankful to and fortunate enough to get constant encouragement, support and guidance from all teaching staff of Mechanical Department which helped us in successfully completing our project work. Also, we would like to extend our sincere esteems to all staff member in laboratory for their timely support.

ABSTRACT

In this wake, a lot of researches have been made for using low grade energy sources such as solar power, waste heat reuse, etc. for the same. The project introduces greener and healthier techniques in current HVAC systems, that is, the system is designed in such a way that it not only works on renewable energy sources fully or partially but also is more efficient in the process of cooling and heating.

The site chosen for this purpose is of Nagpur city-based office building running on conventional system. Further details of the site and system as explained in the topics to follow. When it comes to controlling the indoor temperatures of complex environments such as modern buildings, innovative solutions are required. HVAC systems are relatively climate sensitive, and so the need for modern temperature regulation systems to function reliably in all climates becomes greater.

That's why there is an increasing trend in 21st-century green building design to move away from conventional all-air systems as the primary method of temperature control, and integrate them with TABS – thermally active building systems.

The reason for the up surgency of TABS as a priority green design element in modern commercial construction is a simple two-fold one: they are far more cost-effective and energy-efficient than their counterpart systems.

The end product of this project is design of HVAC system which collaborates in some non-conventional methods with current modern methods to increase efficiency such as TABS, solar VARS and vapor adsorption chillers (not absorption).

The research includes collecting various techniques available, checking for their practicality and implementation of the design in the system. Few iterative designs and simulation of the same were done to arrive at final conclusion of the design.

The project also deals with the comparison of conventional and non-conventional design in terms of economy, efficiency, environment friendly etc.

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