DESIGN AND ANALYSIS OF GOODS ELEVATOR

S.Karthick
Mechanical Engineering
Sengunthar Engineering College
(Autonomous)
Tiruchengode, Namakkal
18me19@scteng.co.in

P.Nisanth
Mechanical Engineering
Sengunthar Engineering College
(Autonomous)
Tiruchengode, Namakkal
18me30@scteng.co.in

L.Vaishnavi
Mechanical Engineering
Sengunthar Engineering College
(Autonomous)
Tiruchengode, Namakkal
18me50@scteng.co.in

Mr.C.Mohankumar,M.E..,
Assistant Professor
Mechanical Engineering
Sengunthar Engineering College
(Autonomous)
Tiruchengode, Namakkal
cmohankumar.mech@scteng.co.in

Abstract--In our project to design the goods elevator based on cabin. It's useful to the transportation of component one place to another place in manufacturing industry. The conventional steel cabin is replaced by new steel model design. The Goods lifts design created in Solid Works software and structural analysis in Ansys software.

1. INTRODUCTION

Many developments have happened in recent years in industries such as manufacturing, computing, and software. They have made great advancements in a variety of fields. By pushing the switch or button, you call a metal box that transports you from one floor to another with safely. In fact, an elevator is mandatory for a building which has more than four to five floors high. This article discusses about goods elevator and how does it works.

2. PROBLEM IDENTIFICATION

Total load of goods lift is carrying on the cabin it leads to materialdeformation and to crack.

So,thecabin material to need the maximum capacity, so conventional structure of cabin replaced by the proposed model. This new model is proposed for lifting load is easily on material transportation.

3. MATERIAL SELECTION

Steel is made up of carbon and iron, with much more iron than carbon. In fact, at the most, steel can have about 2.1 percent carbon. Mild steel is one of the most commonly used construction materials. It is very strong and can be made from readily available natural materials. It is known as mild steel because of its relatively low carbon content.

4. MODELING

All of the processes that lead up to the deployment of excellent software have modeling as a major component. Models are created to communicate our system's desired structure and behaviour. The architecture of the system is visualised and controlled using models.

5.SOLID WORKS SOFTWARE

Solidworks is a 3D CAD/CAM/CAE feature-based, associative solid modeling software. It is one of the suites of collaborative applications that provide solid modeling, assembly modeling, 2D orthographicviews finite element analysis, direct and parametric modeling, and NC and tooling functionality for mechanical designers.
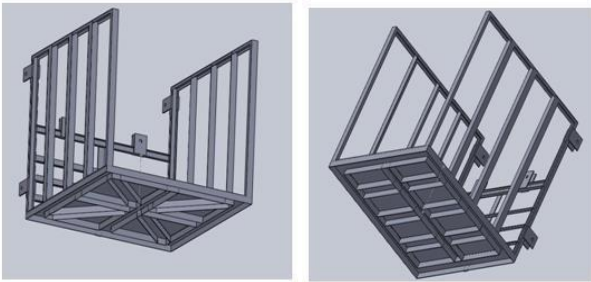
Fig.5.1.Goods lift Designs in Solid Works Software

6.IMPORT &EXPORT

Import and export are handy for transferring files from one software to another, and they're commonly utilised in a variety of ways, one of which is,

- IGES

The Initial Graphics Communicate Specification (IGES) is a vendor-neutral file format that allows computer-aided design (CAD) systems to exchange digital information. A CAD user can communicate product data models in the form of circuit diagrams, wireframe and free form surface or modelling representations using the IGES standard. Traditional engineering drawings, models for analysis, and other manufacturing functions are among the applications supported by IGES. drawings, models for analysis, and other manufacturing activities.

## 7.ANALYSIS OF GOODS LIFT

7.1.Finite Element Analysis;

Finite Element Analysis, or FEA, is the numerical mathematic approach known as the Finite Element Method, or FEM, that is used to simulate a physical phenomena. Mechanical engineering, as well as a number of other fields, are built on this process. It's also one of the foundational ideas of simulation software development. Engineers may use this FEM to decrease the amount of actual prototypes they need to make and undertake virtual tests to improve their ideas. Understanding physical processes that occur all around us necessitates the use of complex mathematics. Fluid dynamics, wave propagation, and thermal analysis are some of the topics covered.

7.2Structural Analysis;

You can tackle difficult structural engineering challenges with ANSYS structural analysis software and make better, quicker design decisions. You may tailor and automate solutions for your structural mechanics issues, as well as parameterize them to examine numerous design scenarios, using the finite element analysis (FEA) solvers included in the suite. For even more accuracy, you may readily link to additional physics analysis tools. Engineers utilise ANSYS structural analysis

software to improve product designs and save physical testing expenses.

8. CONVENTIONAL MODEL
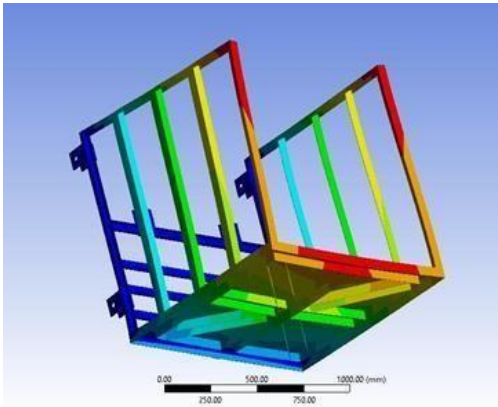
Fig.8.1. Total Deformation in Conventional Model

The overall deformation of the existing conventional model cabin was calculated using ansys software, as shown in the diagram above. Intelligent mesh technology in ANSYS Mechanical allows you to rapidly acquire the best mesh for each model.

Stress
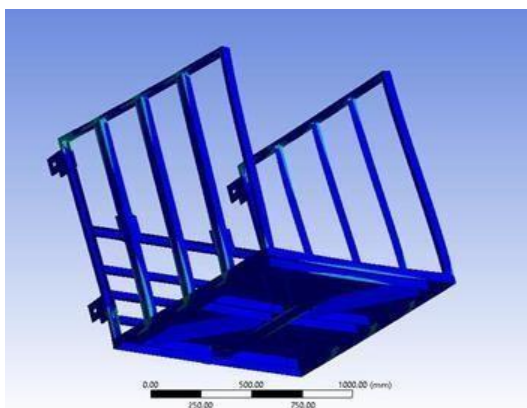
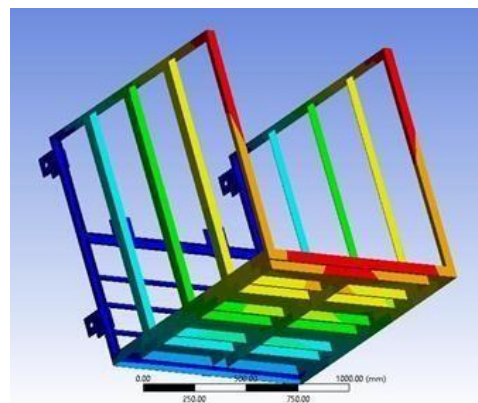**Fig. 8.2. Stress in Conventional Model**

The total weight is acting in cabin at 10000N. To

predict the maximum total deformation17.603mm, similarly maximum stress value is 694.73MPa.
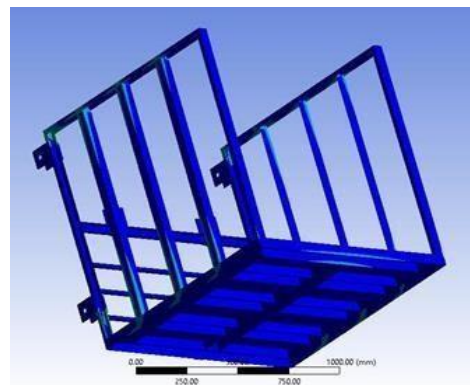
Table 8.1. Overall Existing model Result

Description	Units	Result
Total Deformation	mm	17.603
Stress	Mpa	694.73
Strain		0.0033361

9. PROPOSED MODEL

Fig.9.1. Total Deformation in Proposed Model

Stress

Fig.9.2. Stress in Proposed Model

Table 9.1.Overall Proposed model Result

Description	Units	Result
Total Deformation	mm	5.826
Stress	Mpa	678.47
Strain		0.0032577

10. RESULT

Table 10.1 Overall Comparison Result of Elevator

Description	Units	Existing Model	Proposed Model
Total Deformation	mm	17.603	5.826
Stress	Mpa	694.73	678.47
Strain		0.0033361	0.0032577

11. CONCLUSION

The goods lift model is created in Solid Works parametric software and then analysed in Ansys. Our project was primarily concerned with the cabin structural design, which was intended to replace the proposed structure design. Both cabin constructions are analysed and compared using steel as a common material to anticipate stress and deformation. When compared to the present structure, the suggested lift cabin structure is superior.

12. REFERENCES

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