

# Design and Analysis of a Water Tank

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## ABSTRACT

Storage reservoirs and overhead tank are used to store water, liquid petroleum, petroleum products and similar liquids. This paper presents design of 100,000 lts capacity elevated water tank for 34000 people where SBC of soil is 100 kN/m<sup>2</sup>, grade of steel Fe500, grade of concrete M20 for foundation, for RCC M25. It is designed by using working stress method.

**Keywords**—reservoirs, water tank, working stress method

## I. INTRODUCTION

Storage reservoirs and overhead tanks are used to store water, liquid petroleum, petroleum products and similar liquids. The force analysis of the reservoirs or tanks is about the same irrespective of the chemical nature of the product. All tanks are designed as crack free structures to eliminate any leakage. Water or raw petroleum retaining slab and walls can be of reinforced concrete with adequate cover to the reinforcement. Water and petroleum react with concrete and, therefore, no special treatment to the surface is required. Industrial wastes can also be collected and processed in concrete tanks with few exceptions. The petroleum product such as petrol, diesel oil, etc. are likely to leak through the concrete walls, therefore such tanks need special membranes to prevent leakage. Reservoir is a common term applied to liquid storage structure and it can be below or above the ground level. Reservoirs below the ground level are normally built to store large quantities of water whereas those of overhead type are built for direct distribution by gravity flow and are usually of smaller capacity.

## II. OBJECTIVE

1. To make a study about the analysis and design of water tanks.
2. To make a study about the guidelines for the design of liquid retaining structure according to IS Code.
3. To know about the design philosophy for the safe and economical design of water tank.

## III. INTRODUCTION OF STAAD.Pro

It is one of the effective software which is used for the purpose of analysis and design of structure by the

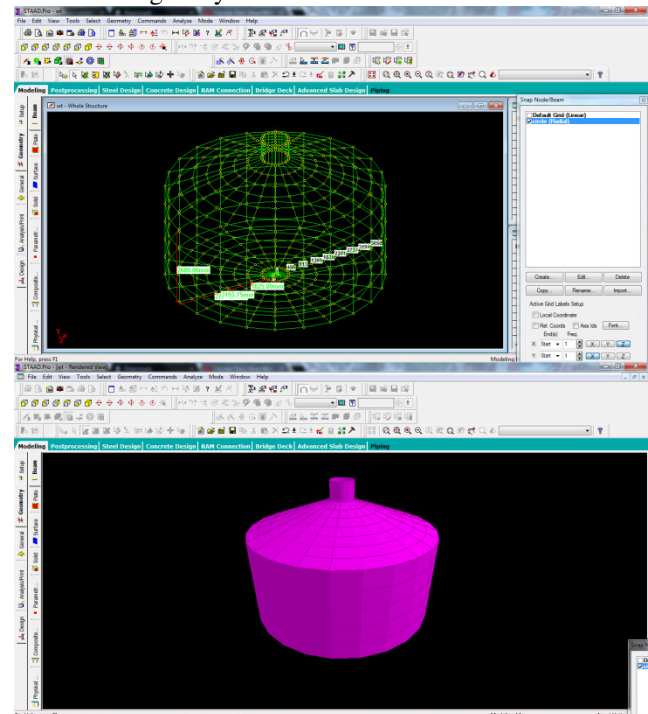
structural engineers. My project is aimed to complete with the help of STAAD Pro. It gives more precise and accurate results than manual techniques.

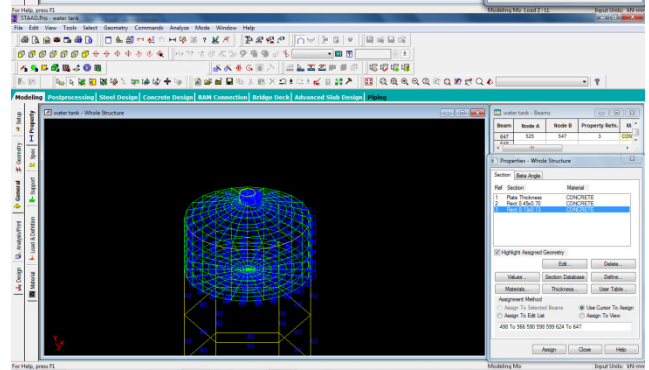
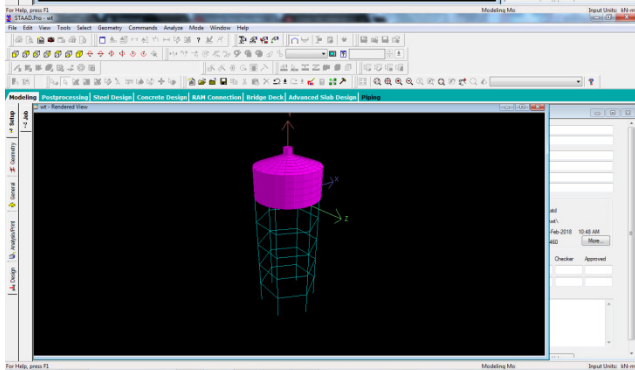
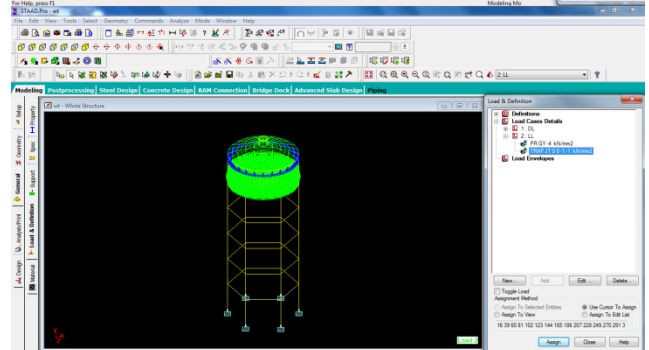
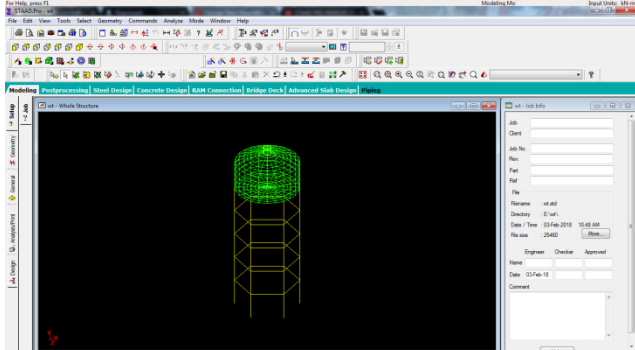
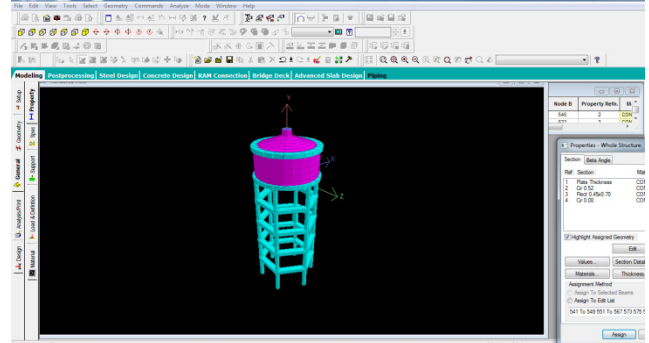
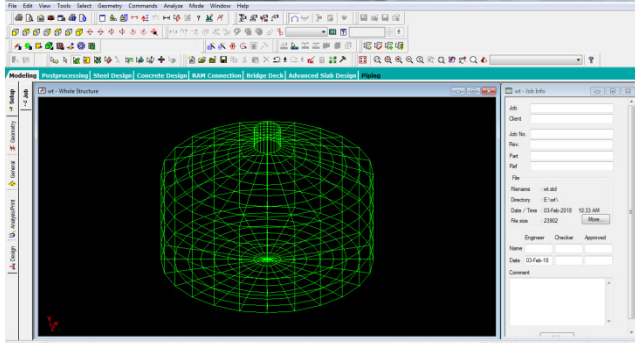
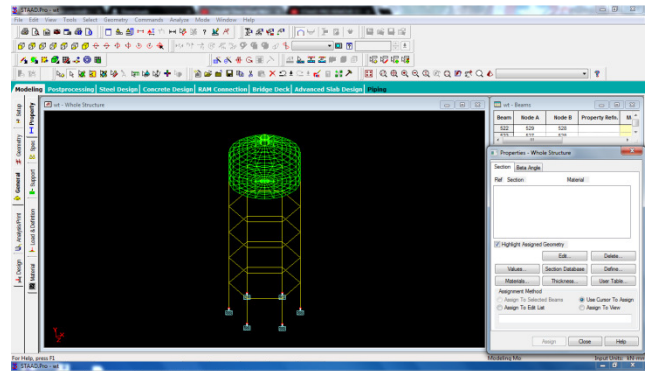
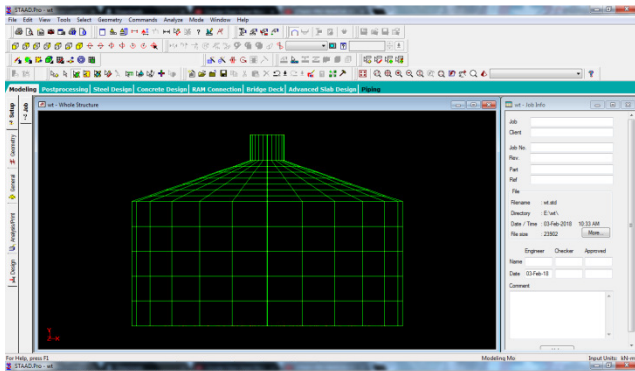
### Advantages of STAAD pro :

1. Extremely Flexible Modeling Environment.
2. Broad Spectra of Design Codes.
3. International Best Seller.
4. Interoperability and Open Architecture.
5. Covering All Aspects of Structural Engineering.
6. Quality Assurance.
7. Extremely Scalable.
8. Easy Reports and Documentation.

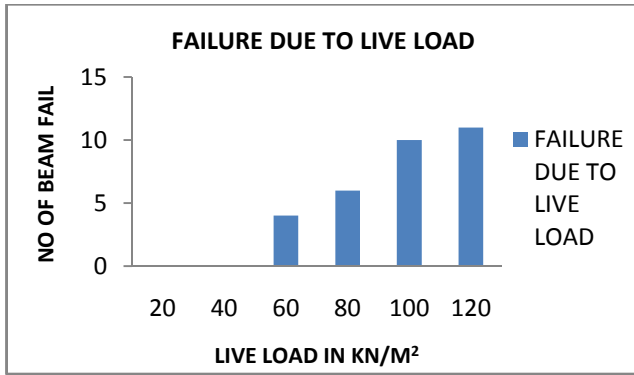
## IV. ANALYSIS AND DESIGN OF STRUCTURAL ELEMENTS

The modeling analysis is done in the STAAD.Pro





## V. RESULT AND DISCUSSION



## VI. CONCLUSION

In a water tank design and analysis increase in live load causes failure of beams and columns. So it can be clearly observed that increase in live load causes failure in the structure.

## VII. REFERENCES

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