

Modeling and Design of High-Rise Statue of Lard Shree Ram using Staad-Pro Software

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INTRODUCTION

Integrating design processing using various designing and modelling software's in high-rise sculpture creates new opportunities for aesthetics discovery. These technologies enable artists to make high rise sculptures and provide safety, modify and disseminate art and make possible a new type of work. By using a behaviour-based software architecture to control a sculptures movement, complex series of coordinated motion can be performed in response to the sculpture's environment and in relation to its internal state. Adding behaviour to sculpture changes the conversation between people and sculpture. As people directly influence the movement of sculpture, the results of this conversation can be stored by sculpture and used to modify the course of future interaction and behaviour. It provides the foundation of a new dialogue between the sculptor, sculpture and the audience.

After studying numerous statues of Patel across the country, a team of historians, artists, and academics chose to proceed with a design submitted by the Indian sculptor, Ram Sutar. The Statue of Unity is a much larger replica of a statue of the leader installed at Ahmedabad International Airport Commenting on the design.

HISTORY OF HIGH-RISE STATUE

Because ancient times could see buildings, which was made apart from being functional Demonstrate the power and wealth of the investor. Such an exhibit of extravagant objects Not only does the immediate surrounding area, but also the neighbouring land have considerable impact.

Seven wonders in those days there were some of the world's most famous buildings. Those seven buildings were being seen by tourists, who generated significant revenue for the surrounding area. The pyramid of chips (about 140 meters) and the light pillar of Alexandria (about 120 meters). They were not only exceptionally high their form could also be considered special. Different types of such things in Cityscape were highly desirable and were appreciated later. Some high-rise statues are described below.



Figure: 1.3- Statue of Liberty

Literature Survey

General

RESEARCH BACKGROUND

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OBJECTIVES OF THE THESIS

The aim of this thesis project is modelling and designing of a high-rise statue of Lord Shree Ram by using different software's such as STAAD.PRO, AUTO CAD & SKECH UP etc. The statue of Lord Shree RAM is generated in Auto-cad software. Length of the statue is very high and it is placed on a high-rise pedestal. The height of the statue is considered as 74 meter and the height of pedestal is considered as 21 meters for modelling and design for the wind load as well as seismic load mainly.

ANALYSIS & RESULTS

For model analysis, the combined action of DL, LL, WL & EQ forces are considered. The structure model has been modelled using STAAD.pro software. Total twenty-five combinations of different load conditions are generated and applied. For design of a slab and shear wall the four nodes plate is used. These plates are supported on beams supported by cylindrical columns.

The supports are taken as fixed support in study and the cross sections of beam are assumed as rectangular in geometry and circular for columns.

The live load is taken as -4 KN/m^2 and floor load is taken as -3 KN/m^2 . The minus sign represents that force is acting toward the gravity in Y-direction. Only outer wall load is considered as UDL of 69.75 KN/m for analysis in all models. Inner wall load is not considered as model analysis. The frame model is analysed in STAAD.pro V8i and the storey drift, average displacement, beam stresses column stress, and beam moments and column moment are calculated.

The different design Codes are used for analysis: -

RCC Design - IS 456:2000

Seismic Loads - IS 1893:2005 (Part 1)

Dead Loads - IS:875-1987 (Part 1)

Live Load IS:875-1987 (Part 2) Wind Load IS:875-1987 (Part 3)

The different cross-sections used in conventional slab models and flat slab models in different geometry are given below: -

- Grade of concrete M60
- Grade of steel Fe-500
- Beam sizes = $300 \text{ mm} \times 450 \text{ mm}$, $500 \text{ mm} \times 900 \text{ mm}$, $600 \text{ mm} \times 1000 \text{ mm}$.
- Column sizes = circular columns having diameter 750 mm , 900 mm and 1000 mm .
- Slab thickness = 200 mm

DETAILING OF RCC STRUCTURE

Detailing of RCC structure will conform to IS: 456. As the structure is located in the low seismic area thus for ductility requirement the guidelines of IS: 13920 shall be followed as per Response Reduction factor of 5.

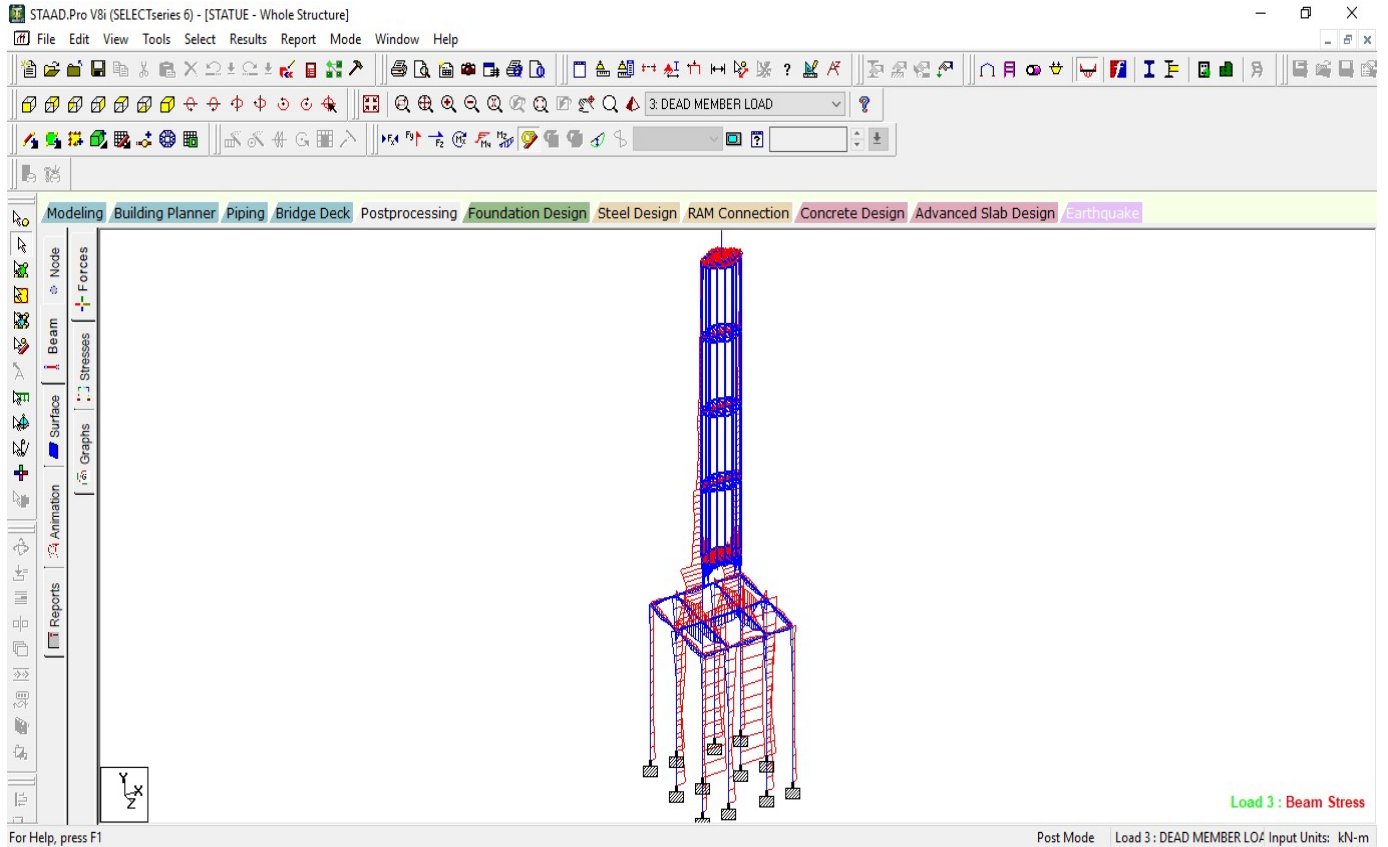


Fig. Staad- pro model showing Beam Stress

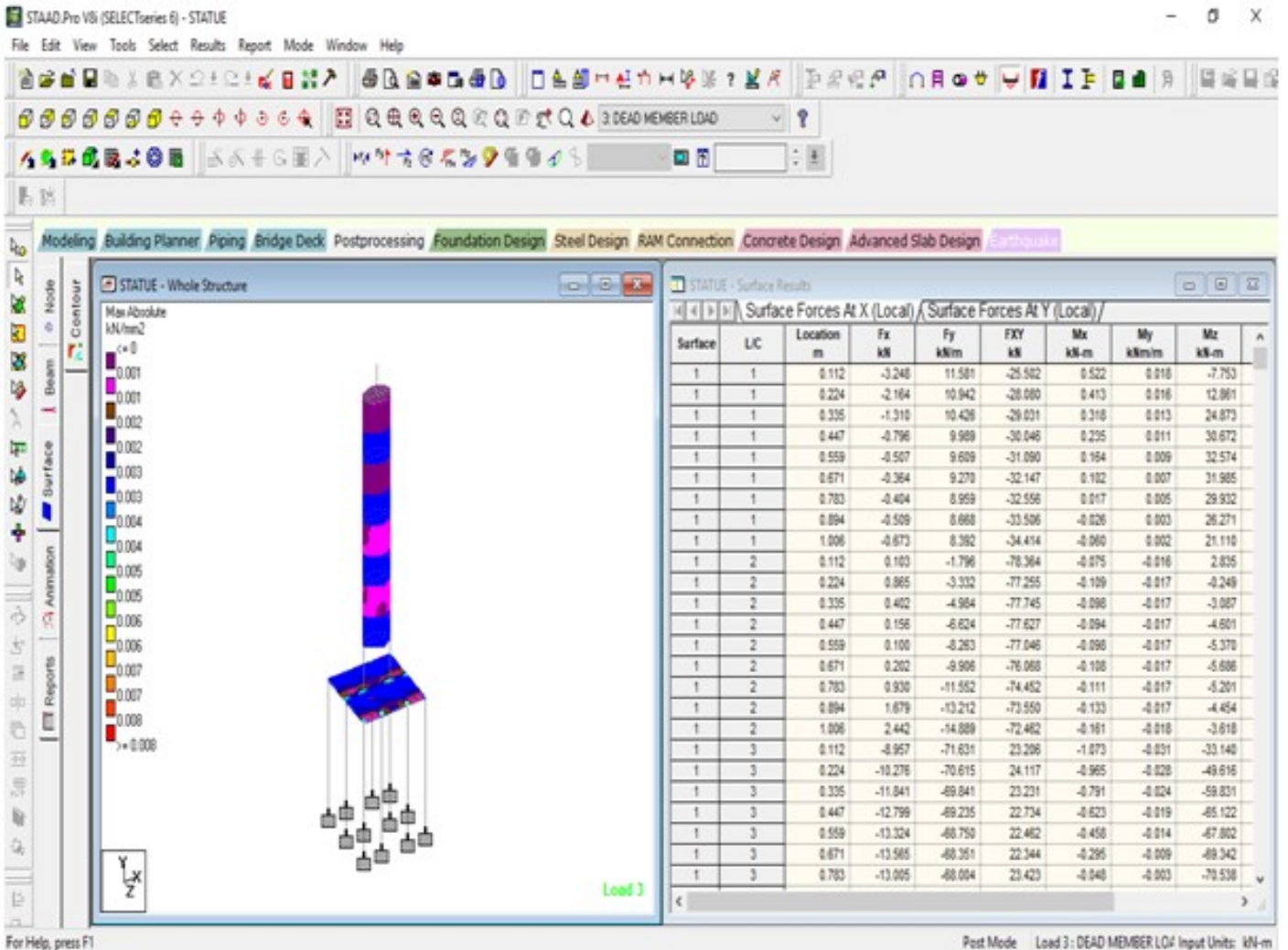


Fig. Staad- pro model showing Axial Load MAXIMUM BEAM MOMENT

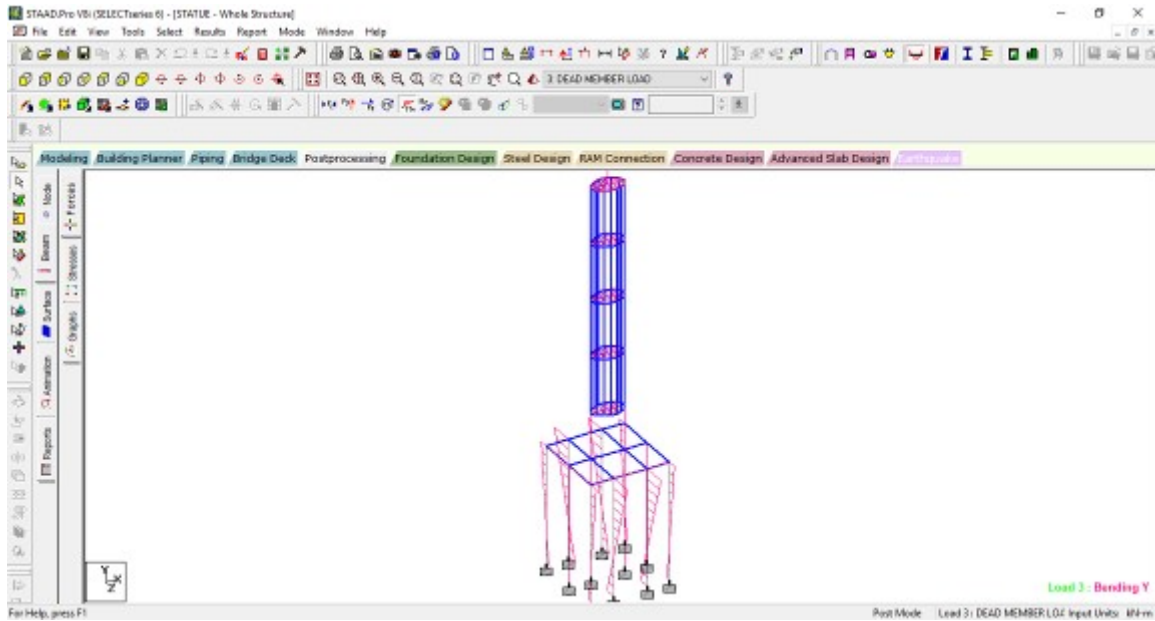


Fig. Staad- pro model showing Bending moment in Y direction

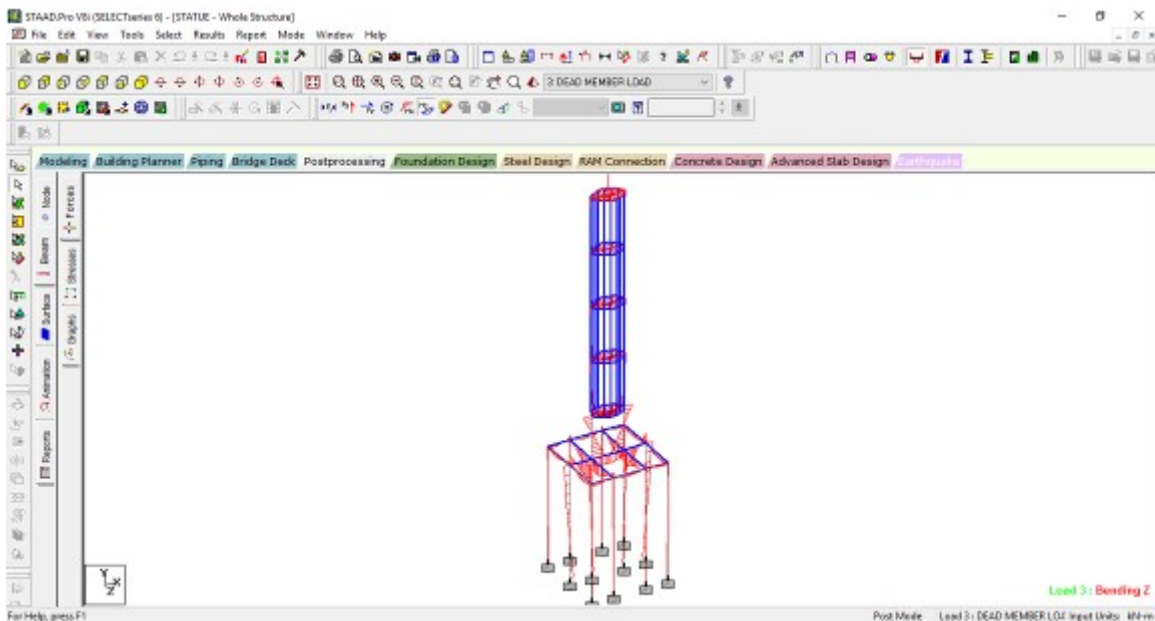


Fig. Staad- pro model showing Bending moment in Z direction

MAXIMUM NODAL DEFLECTION

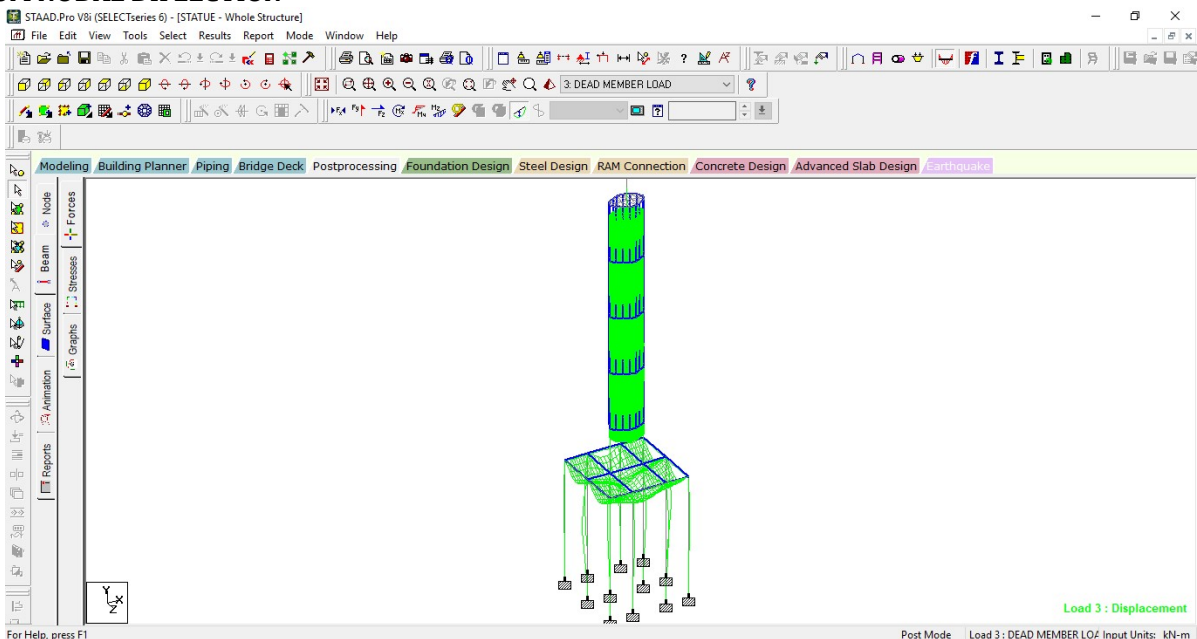


Fig. Staad- pro model showing Displacement in Y direction

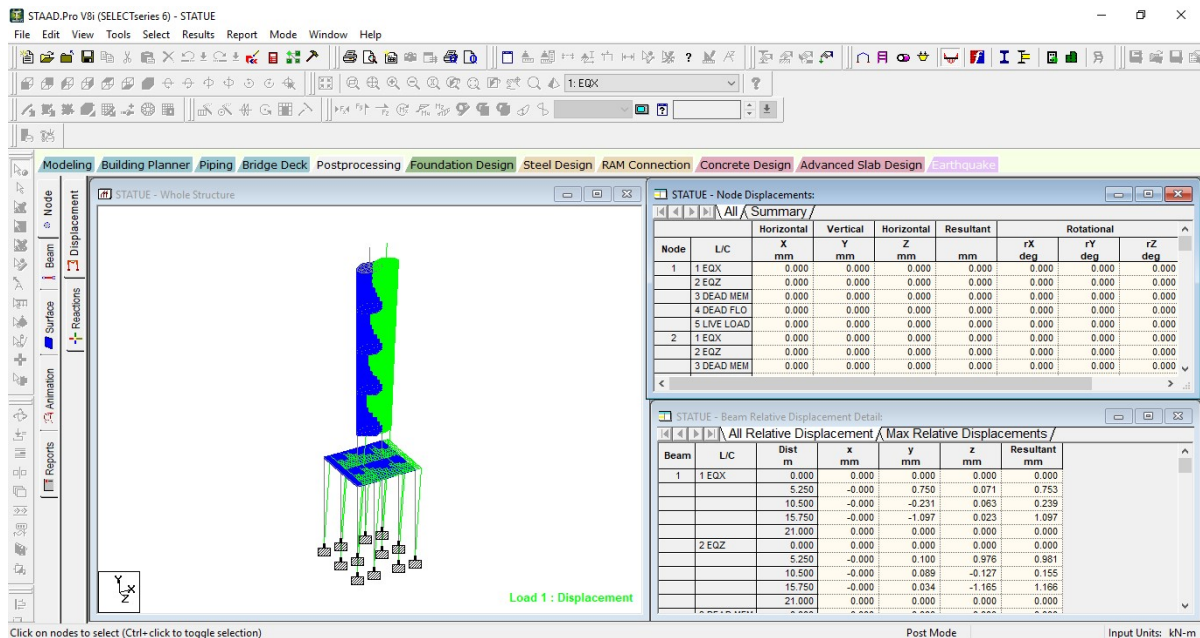


Fig. Staad- pro model showing Horizontal Displacement

CONCLUSION

It is evident from the above results that the seismic hazard has to be carefully evaluated before the construction of important and high-rise structures. Normally the base of the any high-rise structure or statue is larger than the top of the statue or high-rise structure to provide lateral stability of the structure but in our case, it is reverse which is restricted to supported in only two columns shown for feet. And hence it is challenging for designer to design the feet to support the hole statue structure. Based on the above analytical study carried out by the model structures.

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