

# PLANNING, ANALYSIS, DESIGNING AND ESTIMATION OF AN AUDITORIUM

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**ABSTRACT** - This Project work deals with Planning, Analysing and Design of a proposed Auditorium for Saveetha university. The Planning of the Auditorium is done for the total accommodation of 2000 persons with an additional stage capacity to hold 25 persons. All the plans are drawn by using the Auto CADD 2009. The Auditorium is planned as per the guidelines given in the National Building Code (NBC). The Auditorium is designed as a framed structure. IS 456:2000 is followed for manual design of isolated footing, Column, Plinth Beam, Septic Tank and Slab. Also IS 800:2007 is followed for the design of Steel Roof Truss and for its components. The grade of used concrete for the RCC members is  $M_{20}$  and Reinforcing steel used is High Yield Strength Deformed (HYSD) bars of grade  $F_e415$ . Analysis is performed using STAAD Pro V8i software. IS 875 Part I, II, III, IV and IS 1893 Part I are used to calculate Live Load, Dead Load, Wind Load, Load Combination and Seismic Load respectively. The Planning, Designing and Construction of the building is with well-spaced seating arrangement and ventilation. The structure is designed to withstand Earthquake motions.

## 1. INTRODUCTION

The purpose of this project is to Plan, Analyse and Design a Auditorium for Saveetha University. The beams and columns are designed by manually and load for the columns and footings are taken from STAAD Pro results, using concrete of grade  $M_{20}$  & steel grade  $F_e415$ . The foundation of the building is designed as spread foundation. The basement and the superstructure are in brick work CM 1:4 and plastered with ceiling plaster CM 1:3 and 20 mm thick. The roofing of the Auditorium is designed by steel with AC sheets.

## 2. OBJECTIVES

This project deals with a Proposed Auditorium for Saveetha University. It is very much essential for a civil engineer's design will be durable, safe, easy accessible, serviceable, etc. The whole building is well air-circulated and designed for a sophisticated seating arrangement. After planning the Auditorium the structure is analysed and designed by using STAAD Pro and manually. IS Codes and National Building Codes are used for analysis and design. The advantage of using STAAD Pro minimizes the time taken for analysis and design of Auditorium. To cover the planning, designing and analysis of Proposed Auditorium for Saveetha University

- ❑ To design the building elements of Auditorium like Footings, Beams, Columns, Slabs, Roof Truss etc.

- To satisfy all the requirements like seating, lightings, accessories etc.
- To give proposal for building materials used for this entire structure.

### 3. PLAN DETAILS

- **General**

This chapter is filled with the various plans of the Auditorium. Center line plan, floor plan, and elevation are given below

- **Centre Line Plan**

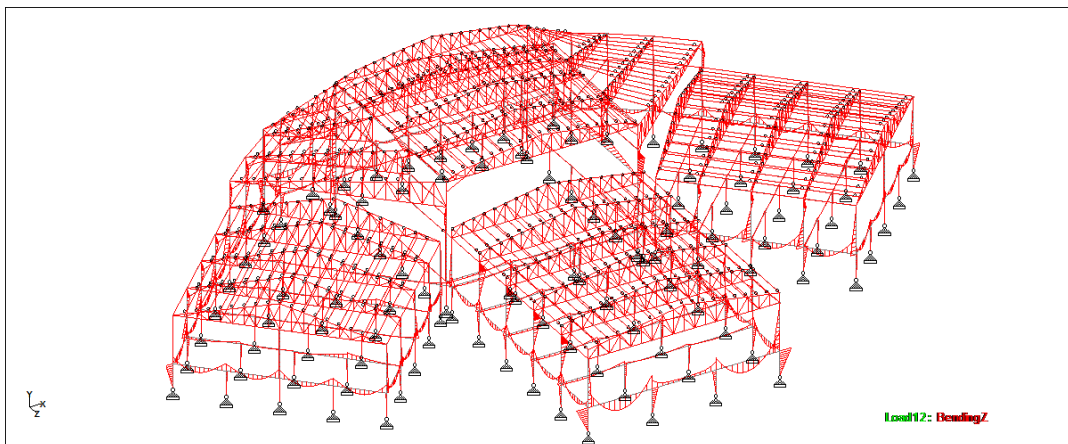
Centre line drawing denotes the centre line of wall and position of column in plan. This kind of drawing is helpful for marking on the site.

- **Floor Plan**

The floor plan consists of two rooms, stage and seating with required pathway. The height of the Auditorium is 5m.

- **Elevation Drawing**

This figure shows the Front Elevation of the Auditorium



Bending Moment for the Structure

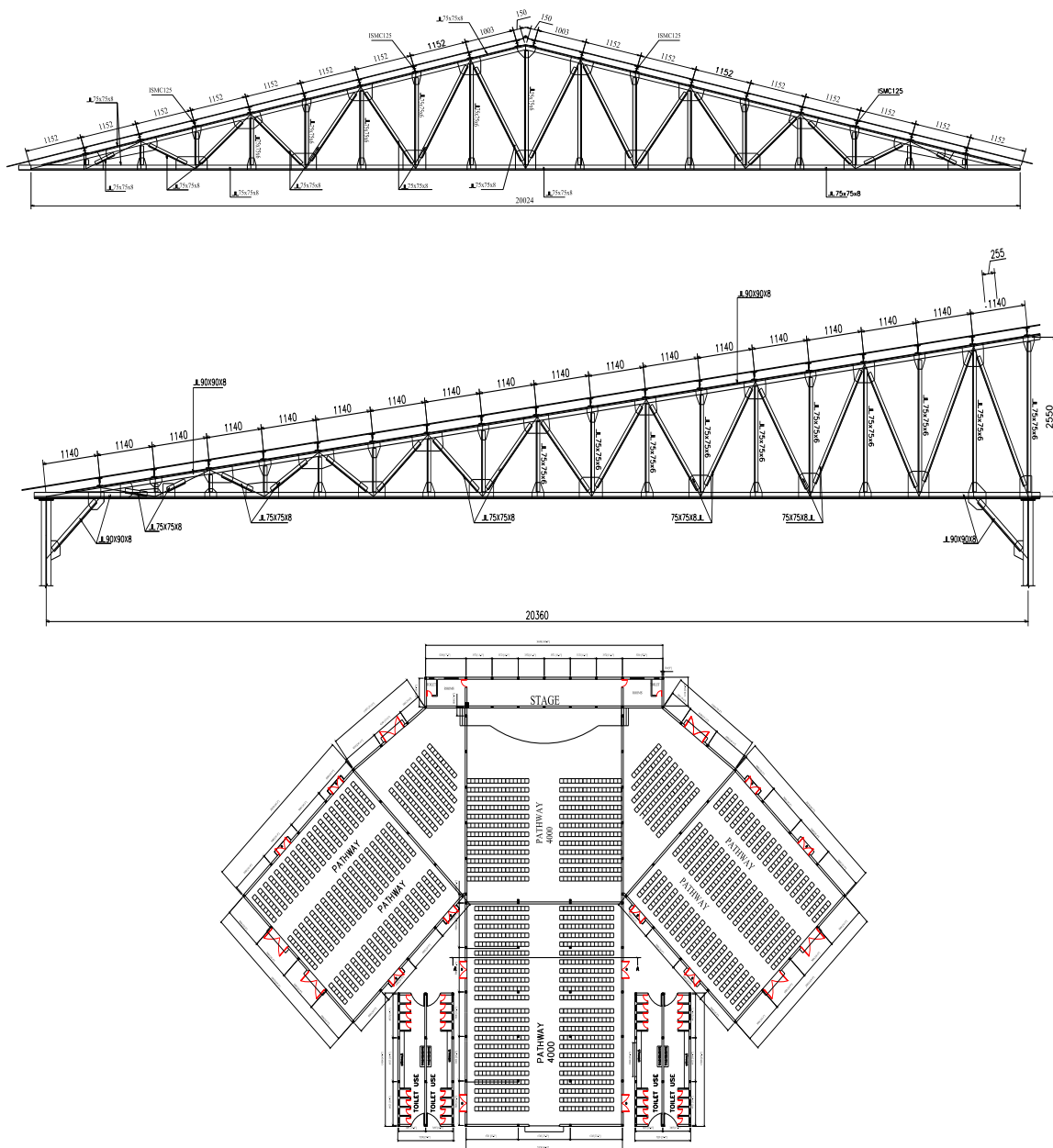
**Minimum diameter of lateral ties is the greater of**

- $[1/4 \times \text{Diameter of longitudinal reinforcement}] = 1/4 \times 20 = 5 \text{ mm}$
- **6 mm Say 6 mm**

**Pitch maximum permitted pitch is the least**

1. Least lateral dimension of the column = 450 mm
2. 16 times the dia or longitudinal reinforcement =  $16 \times 20 = 320$  mm
3. 300mm say **300 mm** Provide **6 mm** dia of lateral ties @ **300 mm c/c**.

**4. DRAWINGS**



## 5. CONCLUSION

The proposed Auditorium in Saveetha University was Planned, Analysed and Designed under Seismic condition. Hence the building is safe under Seismic load and Accidental load. The planning of the Auditorium has well spaced seating arrangement, air circulation and lightened. Necessary software (Auto CADD 2009 & STAAD Pro v8i) were used for Planning and Analysis of the proposed Auditorium. Footing, Septic tank, Water tank, Structural Members like Slab, Beams and Columns are designed manually as per Indian Standard Codes by Limit State Method (LSM). The foundation was designed very strong enough to carry all the loads.

Now a days people have to face Earthquake in their day to day life. Hence at present we have considered the Seismic load in our design.

This building is to be estimated approximately as **Rs. 1,60, 24,135.60.**

## 6. REFERENCES

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