# Event-4

# Field visit to Extension of Steel Truss from 36 Feet to 52 Feet

**Date:** 09th January, 2025

**Venue:** Open auditorium, Gayatri Vidya Parishad College of Engineering for Womens.

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**Project Overview:**

This project showcases an innovative approach to extending an old truss structure, from 36-foot span, to 52 feet. The project was executed by **BTech VI semester students** in collaboration with **BTech final year** and **MTech students** at **Gayatri Vidya Parishad College of Engineering (A)**. The structural modifications were carried out with the guidance and expertise of the **Civil Engineering Department** faculty.

**Site Visit and Initial Setup:**

As part of the learning process, BTech VI semester students were taken to the **steel structure shed** at the **GVP Women's Campus**, where they observed the actual construction and modification of the truss. The structure was designed, fabricated, and erected by the faculty of the Department of Civil Engineering, providing a hands-on learning experience for the students.

**Design and Fabrication of the Truss:**

The primary objective of this project was to modify the existing truss structure to extend its span from **36 feet** to **52 feet**. The process involved several innovative modifications, including the joining of the old truss to a newly designed section, ensuring the stability and functionality of the extended truss.

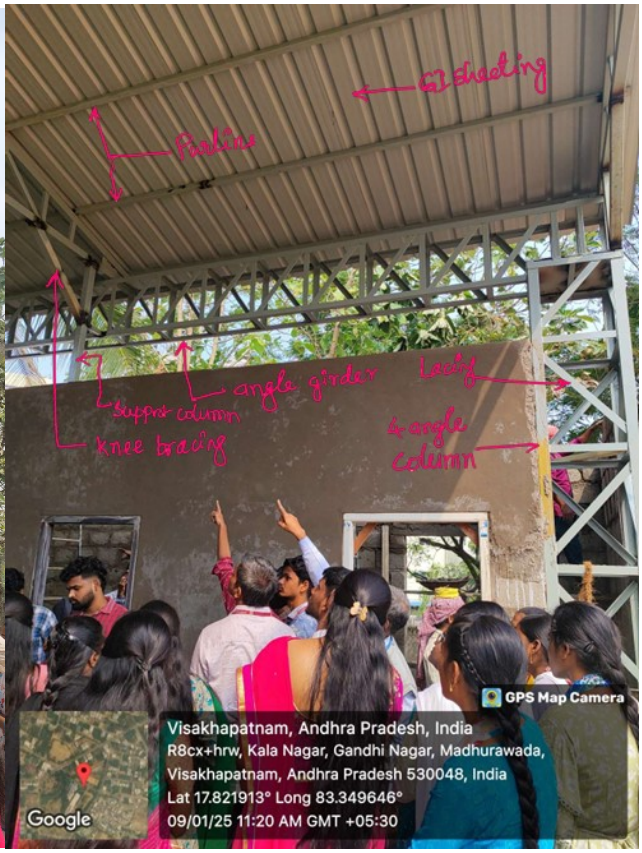
**Modification of the Truss:**

The key modification was the extension of the truss, where the existing truss was connected to a newly designed section. This connection was accomplished using a unique and efficient joining method that ensured the extended span would remain structurally sound.

**Strengthening of the Roof Crown Joint:**

One critical step in the modification was reinforcing the crown joint of the roof. A **gusset plate** was added to provide additional strength and ease during the erection of the truss. This step was essential to ensure the truss extension's feasibility and stability.

In the middle truss, knee bracing was provided to mitigate compressive forces. Since no column support was available at this section, a **square pipe support** was installed from the wall, with knee bracing added to help distribute forces effectively. Knee bracing plays a crucial role in enhancing the structural stability of the truss, especially in sections lacking direct column support.


**Purlin Section and Spacing:**

The purlins were spaced at **900 mm** and spanned **4.5 meters**. The section was selected based on the required section modulus for continuous beams and its compatibility with resting on the rafters. This configuration provided both structural strength and ease of assembly.

**Middle Truss Support and Girder Design:**

Due to the absence of column support for the middle truss, a **compound girder** was designed using four angle sections. This girder was intended to support the load at the truss's midpoint. The compound girder was crucial for maintaining the overall balance and structural integrity of the extended truss.

**Column Design:**

The trusses rest on columns made from four angle sections, each with a length of **12.5 feet**. The columns were laced together to form a stable and resilient support structure. These columns play a vital role in transferring loads from the truss to the foundation, ensuring the overall stability of the structure.

**Base Plate and Anchor Bolt Arrangement:**

Finally, the columns rest on a **base plate**, which is welded to the angle sections. The base plate is securely anchored to the concrete pedestal using bolts, ensuring the entire structure's stability and anchorage. This step provided a secure foundation for the truss and ensured that the modifications would withstand external forces.

**Conclusion:**

This project involved the design, fabrication, and structural modification of a steel truss to extend its span from **36 feet** to **52 feet**. The integration of knee bracing, gusset plates, and compound girders, along with the careful design of purlins, columns, and base plates, ensured the structural integrity and stability of the extended truss.

Through this visit experience, students gained practical knowledge in the design and construction of steel structures, honing their understanding of the importance of innovation, collaboration, and technical expertise in civil engineering. This project stands as a demonstration of the practical application of engineering principles in modifying and strengthening existing structures.