Assignment 1: Creative Structural Design Using ETABS

Objective

The objective of this assignment is to design and analyse a 7-story structure using ETABS, adhering to specified dimensional and load criteria. Emphasis will be placed on creativity in the structural design, moving beyond conventional forms.

Assignment Requirements

Structure Specifications

1. **Base Floor Area:** The base floor area should be 12 inches by 12 inches.
2. **Increase in Floor Area:** From the 5th floor onwards, the floor area should increase by 16 square inches.
3. **Floor Height:** Each floor should have a uniform height of 3 inches.

Loading Conditions

1. **Uniformly Distributed Loads:**
   - **4th, 5th, and 6th Floors:** Apply a total load of 5 lbs uniformly distributed along the perimeter of each floor.
   - **7th Floor:** Apply a total load of 7 lbs uniformly distributed along the perimeter of the floor.

Tasks

1. **Modeling the Structure:**
   - Create a 7-story structure in ETABS with the specified floor areas and heights.
   - Design the structure creatively, exploring various shapes and column configurations.
2. **Applying Loads:**
   - Apply the specified uniformly distributed loads at the 4th, 5th, 6th, and 7th floors.
3. **Analysis:**
   - Perform a structural analysis to determine the behavior of the structure under the applied loads.
   - Generate and interpret the results, focusing on deformations and internal forces.

Deliverables

1. **ETABS Model File:**
   - Submit the ETABS model file (.edb) of your structure.
2. **Screenshots:**
   - Provide screenshots of the elevation views from both the front and side.
   - Include a screenshot of the deformed shape of the structure after analysis.

3. **Design Report:**
   ○ Prepare a brief report summarising your design approach, key decisions, and analysis results. Discuss any unique features or creative elements in your design.

Submission

- Submit all deliverables via the google form by 14th june 11:59pm.
- Ensure your ETABS file is named as follows: [YourFirstName_RollNo.edb].
- Combine all screenshots and the design report into a single PDF or PowerPoint file named [YourFirstName_RollNo.pdf or .pptx].

  Link of the google form for submission:
  https://docs.google.com/forms/d/e/1FAIpQLSflnwE-dFtWoaQiNjmyrBrzqwRlfu330sTUsmq4eyN9mBxZSA/viewform?usp=sf_link

- Explore various structural forms and layouts; consider innovative column placements.
- Ensure your design is both structurally sound and visually appealing.
- Pay attention to the details in your report, clearly explaining your design choices and analysis results.

Good luck, and we look forward to seeing your innovative structural designs!

If you need any help with ETABS, Feel free to reach out to us.