Design Project

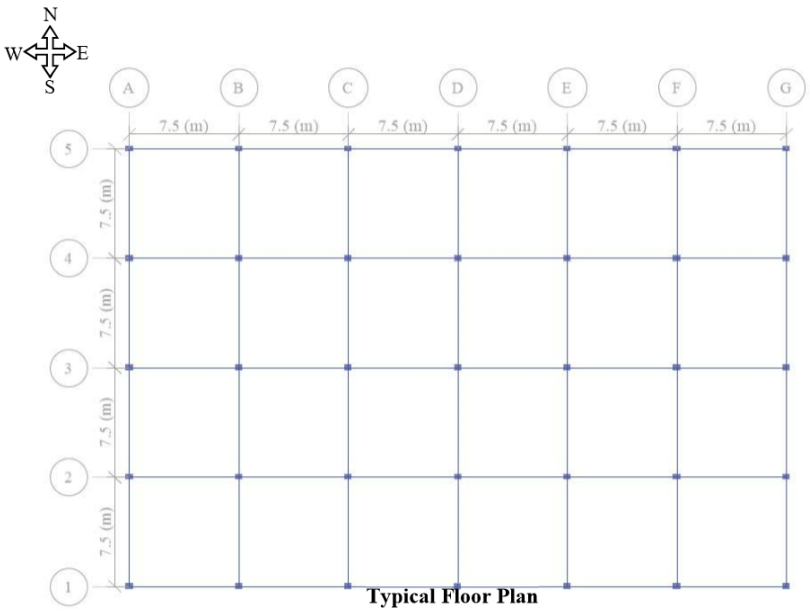
11 March 2022 15:17

CE 629A: Earthquake Analysis and Design of Structures
Design Project
Due Friday, April 15, 2022

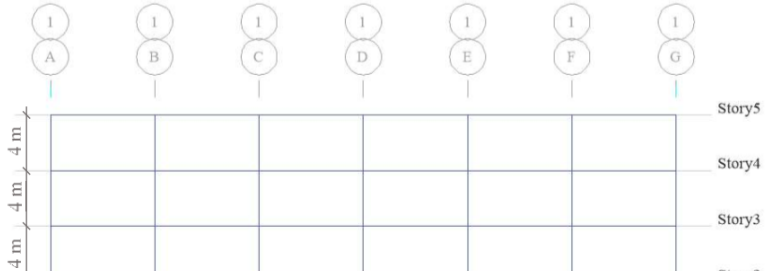
Problem Statement

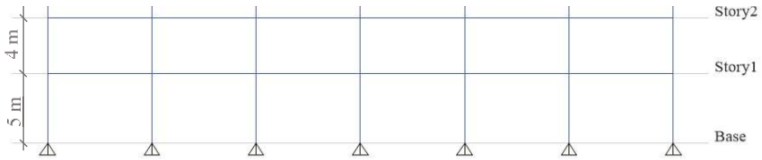
A five-storey office building needs to be designed for seismic zone V on a medium stiff soil site. A typical floor plan and two side elevations of the building are shown below. The floor plan assumes an RC frame structure, and therefore the columns are shown with rectangles. You are required to select and design an appropriate lateral force resisting system for the building. The table below presents some of the lateral force resisting systems with the associated extra credit that you can earn.

Lateral Load Resisting System	Extra Credit (%)
Reinforced Concrete Special Moment Resisting Frame	0
Reinforced Concrete Ductile Shear Wall	0
Reinforced Concrete Ductile Shear Wall with Reinforced Concrete Special Moment Resisting Frame (Dual System)	10
Steel Special Moment Resisting Frame	25
Steel Special Concentrically Braced Frame	25
Steel Eccentrically Braced Frame*	40
Steel Buckling Restrained Braced Frame*	50
** IS codes provide very little to no information about these systems*	



Typical Floor Plan





E-W Elevation

N-S Elevation

You will work preferably in a group of two members. Each group will submit a written report and make an oral presentation. The report must include the following:

1. Load calculations
2. Key structural analysis results
3. Design and drawing of one lateral force resisting system
4. Any assumptions that you make
5. A list of references that you have used in the project

Note that not more than two groups are allowed to choose the same lateral force resisting system.