Analysis II Project

1st Semester 2020/2021

A Gallery building is to be constructed from structural steel. A typical frame is shown below with the applied dead loading and wind loading. The aim is to try different geometries with different possible loadings. Your task is to assume different values for the geometry and loading setting (s1, s2, s3, H1, Lw, w1, w2) and analyze the frame using the moment-distribution method. Develop an excel sheet to analyze the frame and analyze one case by hand to control the developed excel sheet.

It is recommended that all input variables can be modified in the excel sheet, and the analysis sheets are updated automatically.

Requirements:

- One PDF file for the solution of the frame system using the moment-distribution method
- One Excel File for the analysis of the frame using the moment-distribution method
- The analysis sheets need to include the following load combination 1.2D + 1.0W, take care that wind loading should be applied once at every side of the frame. Therefore, the analysis is performed for two load combinations
- Within the excel file, the axial, shear, and bending moment diagrams of the columns and the beams are calculated and drawn based on the applied loading and the calculated end-moments
- Determine the horizontal drift of the frame for the service loads
- A video to explain and describe the developed excel file with the analysis sheets and the implemented equations within the excel file. The video should show you and your analysis sheets (hint: zoom is a good app for this). You send the file's link from your chosen drive