

CE-170 Structural Analysis - Final Project

Statement:

Perform structural analysis on a typical section of the Gutterson parking building. The section will be indicated by the instructor. The following loads must be included: Dead load (D), live load (L), snow (S) and seismic (E). You must report: support reactions, connection forces, shear, axial and bending moment diagrams and maximum deflections for all load cases and load combinations.

Specifications:

For all loads and load combinations use recommendations by ASCE7-10 (or more recent if available).

All ground supports shall be considered rigid. Girders and floor slabs are to be considered simply supported.

Self-weight of concrete = 145 lb/ft^3

Elastic Modulus of Concrete = 3,500 ksi

For the calculation of moment of inertia of cross sections use dimensions of gross concrete sections and neglect the contribution of the steel reinforcement.

Use Imperial units. Report forces in kip, moments in kip-ft and deformations in inches.

All dimensions of the structure shall be taken from the drawings provided by the Instructor.

Final Report:

The final report must include the following sections:

- Introduction: Describing the building, its dimensions and location.
- Load Path: Describing the loads considered and their corresponding load path.
- Load analysis: Quantitative analysis of all loads and load combinations.
- Summary of Structural Analysis: Summarizes all required results for all members, all loads and all load combinations.
- Detailed Calculations: This section contains all supporting calculations in detail.
- The report must contain a cover page, cover letter, table of contents, list of figures. All pages must be numbered sequentially. The name of the doer and checker for each calculation must be provided.