Salvadoris Structure in Architecture The Building of Buildings 4th edition Salvadori Solutions Manual

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Chapter 2: Building Loads and Codes

The chapter discusses the loads structures must resist. The difference between dead and live loads is explained and typical weights of building materials are tabulated as are most frequent design loads for various structures.

Permissible loads are dictated by international as well as local building codes.

Safety factors, the ratios between permissible and actually applied loads are also part of the codes.

The intensity of snow and wind loads over the United States are shown on maps. Their destructive effects are presented.

Stresses and elongations produced by temperature changes and by support settlements are discussed together with techniques to reduce their effects.

The differences between static or slowly applied loads and dynamic loads are explained.

Dynamic loads, such as impacts, vibrations and earthquakes are described. Resonance and fundamental periods of motion are introduced.

A seismic intensity map for earthquake intensities over the US is presented.

Various structural damping systems for dynamic load mitigation are also shown.

Summary of Ideas Presented in Chapter 2:

- Structure is the load-carrying part of physical objects.
- Loads are categorized as applied and hidden loads.
- Applied loads are the ones the structure must support. These are as follows: Dead loads (the weights of building materials and of all permanent fixtures); live loads (occupancy loads and movable fixtures); wind, snow, and earthquake loads; as well as others, such as dynamic loads produced by machinery.
- Hidden loads are produced by thermal environments and support settlements.
- Building codes dictate the design values for each load category depending on the purpose of the building. The codes may also prescribe heights, and type of construction depending on locality.

Chapter 2 Questions and Exercises:

1. Look around the places where you live and work or go to school: What objects would be classified as dead loads and which ones as live loads?
2. What types of structural elements can you observe in buildings you are familiar with that function to resist lateral forces? What makes them different from that part of the structure that resists gravity (i.e., primarily vertical) loads, and how can you tell the function?

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3. A developer wishes to build a skyscraper hotel in Miami, Florida. What type of loading should be considered? If the same structure is to be built in Maine, should the loading be different? How about building it in San Francisco?
4. Why do houses located on the Palisades on the California Coast require special foundations? What type of foundations should be used?

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