Seismic Analysis and Design of Hospital Building

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Introduction

Nepal is prone to frequent earthquakes, earthquake of 2015 reminded us of catastrophic consequences of poor building design. Buildings especially important buildings like hospitals needs to be designed so as to withstand the vibrations and minimize destruction of human life and property.

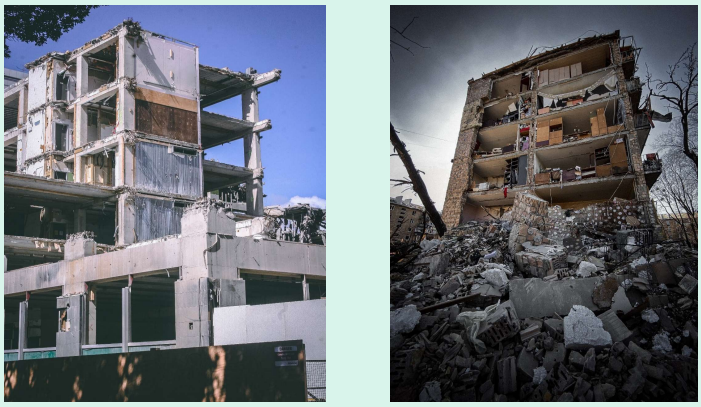


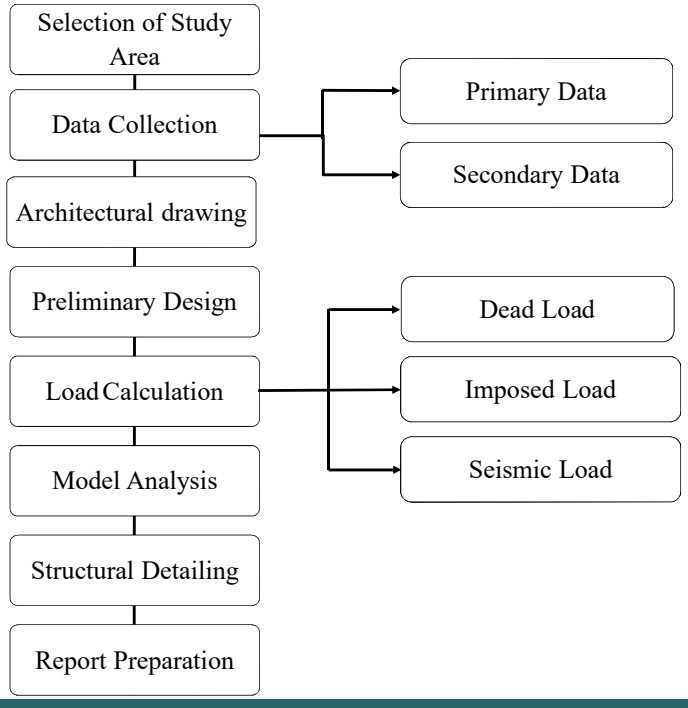
Figure 1: Collapsed Buildings due to Earthquake

If building does not conform to standard design codes then the building suffers from the sudden structural failing, threatening human life and health. Examples of such structure failure are shown in Figure 1.

Objectives

- To prepare architectural drawings of the hospital building.
- To make preliminary design of structural components.
- To model the building for structural analysis.
- To prepare a detailed structural drawing of the hospital building following IS codes and NBC codes.

Methodology



Modelling

After preparation of floor plans, Autodesk Revit was used for 3D modelling of the hospital building. This model visualizes the dimension and layout of the building. Architectural parameters like floor area of rooms, circulation, floor height, dimensions of staircase, etc. were well considered.

Figure 2: Exterior of the hospital building

Modelling of the hospital building was done in ETABS for structural analysis. The 3D model was made using preliminary design values of grade of steel and concrete and dimension of structural members (beams, columns, slabs) were fixed as per the result of preliminary calculations.

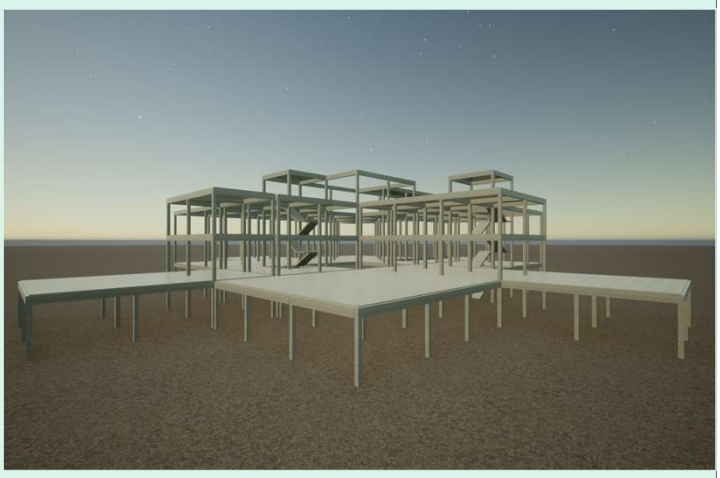


Figure 3: Frame structure of the building

Expected Outcomes

- Architectural drawings of the hospital building.
- Preliminary design of structural components.
- Model of the building for structural analysis.
- Detailed structural drawing of the hospital building following IS codes and NBC codes.

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3D view of model

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