Chapter One

Introduction

1.1 Introductory remark:

A structure refers to a system of connected parts used to support a load. Important examples related to civil engineering include buildings, bridges, and towers; and in other branches of engineering, ship and aircraft frames, tanks, pressure vessels, mechanical systems, and electrical supporting structures are important.

This deals primarily with fundamental principles in the design and investigation of reinforced concrete members subjected to axial force, bending moment, shear, torsion, or combinations of these. Thus these principles are basically applicable to the design of any type of structure, so long as information is known about the variation of axial force, shear moment, etc., along the length of each member. Although analysis and design may be treated separately, they are inseparable in practice, especially in the case of reinforced. [1]

When designing a structure to serve a specified function for public use, the engineer must account for its safety, esthetics, and serviceability, while taking into consideration economic and environmental constraints often this requires several independent studies of different solutions before final judgment can be made as to which structural form is most appropriate. This design process is both creative and technical and requires a fundamental knowledge of material properties and the laws of mechanics which govern material response.

Once a preliminary design of a structure is proposed, the structure must then be analyzedto ensure that it has its required strength and rigidity. To analyze a structure properly, certain idealizations must be made as to how the members are supported and connected together. The loadings are determined from codes and

local specifications, and the forces in the members and their displacements are found using the theory of structural analysis. The results of this analysis then can be used to redesign the structure, accounting for a more accurate determination of the weight of the members and their size. Structural design, therefore, follows a series of successive approximations in which every cycle requires a structural analysis. the structural analysis is applied to civil engineering structures; however, the method of analysis described can also be used for structures related to other fields of engineering.

The multi-storey building is statically indeterminate structure and there are several methods to analysis this structures such as method three and moment distribution...etc.

To analyze and design the multistory building we must analyze and design the elements that combined it, such slabs, beams, columns and footing.[1]

1.2 Statement of problem:

Most civil engineersin Sudan use BS8110-1997code for designing the reinforced concrete building , This research attempt to apply three codes(BS8110-1997, EC2-1992 ,AC1-2005) for design tall building so as to know which of theseare suitable for Sudanese civilengineers designers.

1.3Researchobjectives:

1- To review and study different international codes to point out requirements of design.

2- To design multi storey building by using different codes BS 8110, EC2-1992, and ACI-2005.

3- To compare among the results that obtained from Etabs and Safeprogrammes and manual design.

1.4 Methodology:

information was collected from different references and multi storey building was selected with twenty storey floors. It consist of flat slab, columns, raft foundations, shear walls and staircases. Manual calculations and Etabs and safe programmes were used to analyze and design the building by using different codes BS8110-1997, EC2-1992, ACI 2005.

1.5 Outlines of thesis:

Chapterone:contains general introduction.

Chaptertwo:attempt literature review.

Chapterthree:include the requirements of different codes to design elements.

Chapterfour:design of twenty storeys building by using different codes.

Chapterfive:conclusion and recommendations.