



COMPLETE RCC PROJECT DESIGN [HIGH-RISE PROJECTS]



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SOFTWARES INCLUDED

Structural
Design (G+40)



Manual
Design



Structural
Detailing

ETABS

SAFE

SAP 2000



INDIAN & INTERNATIONAL DESIGN CODES COVERED

INDIAN STANDARDS

- IS 456
- IS 875
- IS 1893
- IS 13920
- SP 34
- IS 16700

INTERNATIONAL STANDARDS

- UBC 97
- CEB FIP 2010
- ACI 318
- BS 8110



Introduction

1. Roles and responsibilities of Structural Designer
2. Complete project life cycle
3. Various departments and respective scope
4. Introduction to RCC structures
5. Thumb Rules in design
 - Slab
 - Beam
 - Column
 - Footing




Live Projects

- Covered
1. **G + 5**
 2. **G + 7**
 3. **G + 11**
 4. **G + 34**
 5. **G + 40 (Complex Project)**
 6. **Bungalow Projects**



Superstructure Design

ETABS

- Understanding client requirements
 - Intro. to Architectural Plan
 - Grid-Line method
 - Center-Line method
 - Gravity Loads & *Lateral* Loads
 - Modelling, Placing & Orientation of column
 - Types of required analysis
 - Criteria for shear wall
 - Loading criteria & loading types
 - Types of plate elements
 - Modal Analysis
 - Codal requirements
 - Design of RCC Elements
 - Design of Shear Wall
- 



Superstructure Design

ETABS Advanced

✓ Everything in ETABS mentioned on previous page, along with following data

- Different types of structural systems
- Different SMF (Stiffness Modification Factors)
- Uncracked Model
- Strength Model
- Service Model
- Wind gust analysis
- Wind tunnel analysis
- Energy Vs. Virtual work diagram
- Composite structure elements
- Orthogonal & non-orthogonal analysis
- Modal Analysis
- HRC Norms
- Buckling Analysis
- Creep & Shrinkage Analysis
- Concept of transfer girder
- Concept of PT elements
- Selection & Provision of PT elements
- Optimization of design



Stability Checks

- Deflection check
- Story Drift
- Base Shear Scaling
- Soft Story
- Creep Deflection
- Axial shortening
- Story stiffness
- Differential SMF
- Deflection against wind & Earthquake
- Torsion irregularity






DBR

Preparation of design report
High-Rise committee norms
Submission of data

| Client dealing
| Municipal submission

Mock Test - I

-  Mock Modelling Test
-  Project Activity
-  Presentation in the form of DBR



Manual Design



- Step-by-step procedure for Design of RCC elements
- IS Code requirements
- Structural analysis concepts
- Designing of RCC elements using Excel sheets
- Designing of RCC elements using manual calculations

Mock Test - II

- ☒ Project Activity
- ☒ Presentation in the form of PPT



Substructure Design

SAFE

- Introduction to foundation system
- Types of foundation
- Criteria for selection of foundation type
- Types of support
 - Point Spring | Line Spring | Area Spring
- Soil bearing capacity (SBC)
- Geotechnical soil report
- Manual design of foundation system
- Property assignment of rigid zones for walls and ramps
- Design strips
- Tendon load and its losses. Loading : dead, live, wind, earthquake, temperature, notional, live load reduction
- Releases, supports, diaphragms, all definition parameters
- Design of stirrups
- Design of slabs based on finite element method
- Design of raft & pile foundations
- Design of punching shear reinforcement (stud rails).
- Flat slabs with post tensioning.
- Checks on post tensioning stress
- Generating output & display of deformed geometry
- Detailing & reporting techniques
- Codes & software interaction by considering national and International Codes



Stability Checks

- Punching shear check
- One-way shear check
- Settlement check
- SBC Check
- Concept of design checks
- Detailing of foundation system
- Soil structure and interaction(SSi). 3. Checks on foundation system
 - a. Deflection
 - i. Short term deflection.
 - ii. Long term deflection considering creep.
 - b. Crack Width
 - c. Punching Shear
 - i. One-Way Shear.
 - ii. Two-Way Shear.
 - d. Reinforcement checks.
- Differential settlement of foundation and its control.
- Nonlinear analysis by considering long term creep.
- Nonlinear analysis for cracked conditions.
- Significance of each analysis and its uses using various codes.

Mock Test - III

- ✓ Mock Modelling Test
- ✓ Project Activity
- ✓ Presentation in the form of DBR



Structural Detailing



- IS 456 Requirements
- Design steps for RCC elements
- Detailing requirements as per IS 1893 & IS 13920
- Step by step procedure for exporting data from ETABS to RCDC
- Detailing as per "Resultant Method" & "Discrete Method"
- Setting of RCC drawings as per site requirements
- Detailing of slab, beam, column, shear wall, footing

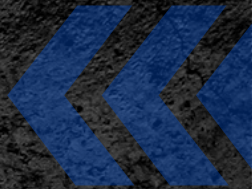


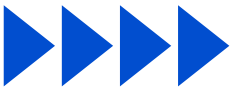
Water Tank + Septik Tank + Staircase



SAP2000

- UGT | OGT | OHT
- Analysis of Plate Elements
- Shell Stress Analysis
- Flexural Stresses
- Tank design using manual calculations
- Site requirements
- Detailing requirements





MOCK INTERVIEWS

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