

structedu

Exploring Potential

ETABS (Mid-Rise)

CURRICULUM

1. INTRODUCTION

2. WORK FLOW IN STRUCTURAL DESIGN

3. DATA REQUIRED TO DESIGN A BUILDING

4. UNDERSTANDING ARCHITECTURAL DRAWINGS

5. UNDERSTANDING SOIL REPORT

6. CONFIGURING THE GIVEN BUILDING

6.1 General Arrangement of Structural Elements

6.2 Minimum Sizes for Structural Elements

7. MODELLING PROCESS

7.0.1 Understanding User Interface of ETABS

7.0.2 Work Flow In ETABS

7.1 Start & Setup a New Model in ETABS

7.2 Definition of Properties in ETABS

7.2.1 Moment of Inertia for Structural Analysis as per IS 1893-2016

7.2.2 Definition of Material Properties

7.2.2.1 Definition of Column Section Properties

7.2.2.2 Definition of Beam Section Properties

7.2.2.3 Definition of Slab Section Properties

7.3 Modelling Elements

7.3.1 Modeling of Columns

7.3.2 Modeling of Beams

7.3.3 Modeling of Slabs

7.3.4 Modeling of Staircase

7.4 Loading

7.4.1 Application of Gravity Loads

7.4.2 Application of Earthquake Loads

7.4.2.1 What is Earthquake?

7.4.2.2 What happens to a building during an Earthquake?

7.4.2.3 Why does a building fail during an Earthquake?

7.4.2.4 Failure patterns during an Earthquake

7.4.2.5 Introduction to IS 1893 Part 1 2016

7.4.2.6 Types of Earthquake Analysis

7.4.2.7 Design Lateral Force (Base Shear)

7.4.2.8 Seismic Zones in India (Z)

7.4.2.9 Importance Factor (I)

7.4.2.10 Response Reduction Factor (R)

7.4.2.11 Design Acceleration Coefficient (s_a/g)

7.4.2.12 Fundamental Natural Time Period

7.4.2.13 Application of Earthquake loads in ETABS

7.4.3 Application of Wind Loads

7.4.3.1 Basic Concepts and Codal Provisions of Wind Loads

7.5 Support conditions at base (Fixed or Pinned?)

7.6 Load Combinations (Load Patters Vs Load Cases Vs Load Combinations)

8. ANALYSIS & RESULT INTERPRETATIONS OF THE BUILDING

8.1 Check for Modeling Errors

8.2 Running Analysis

8.3 Stability checks as per IS Codes

8.4 Checking Moments & Shear Forces for Beams

8.5 Checking Moments & Shear Forces for Columns

8.6 Checking Moments & Shear Forces for Shear Walls

8.7 Checking Moments & Shear Forces for Slabs in ETABS

8.8 Interpretations of Base Reactions

8.9 Governing Lateral Force (Seismic or Wind)

9. DESIGN & DOCUMENTATION

9.1 Design of Slab

9.1.1 Design of Slab in ETABS

9.1.2 Design of Slab using Manual Calculations

9.1.3 Shell Element Vs Membrane

9.2 Design of Beam

9.2.1 Design of Beam in ETABS

9.2.2 Design of Beam using Manual Calculations

9.3 Design of Column

9.3.1 Design of Column in ETABS

9.3.2 Design of Column using Manual Calculations

9.4 Design of Shear Walls

9.5 Documentation

10. COLLATERAL CONCEPTS

10.1 Quick generation of model using DXF import

10.2 Significance of Model Explorer

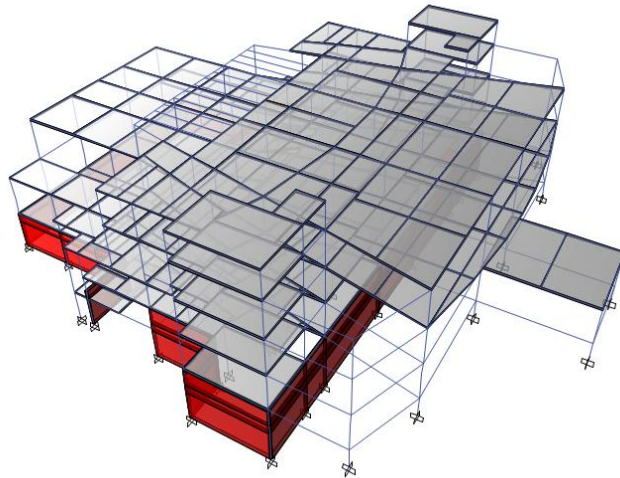
10.3 Additional Modeling Options

10.4 Estimating Design Lateral Force (Base Shear) using Manual Calculations

10.5 Damping

11. ASSIGNMENTS

12. TESTS



TAKE AWAY OF THE COURSE

Complete Understanding on Structural Design of Buildings (Mid Rise)
Complete understanding on Earthquake Concepts
Hands on Experience on the Earthquake Resistant Design of Buildings (Super Structure)
Understanding on Manual design fundamentals
Exposure on Standard Codes like
IS 1893 2016 (Seismic Resistant Design of Buildings)
IS 456 2000
IS 875 PART I
IS 875 PART II
IS 875 PART III
Complete understanding on ETABS Software