

Seismic Design of Buildings to Eurocode 8 in Singapore

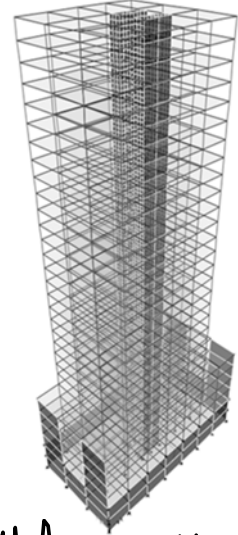
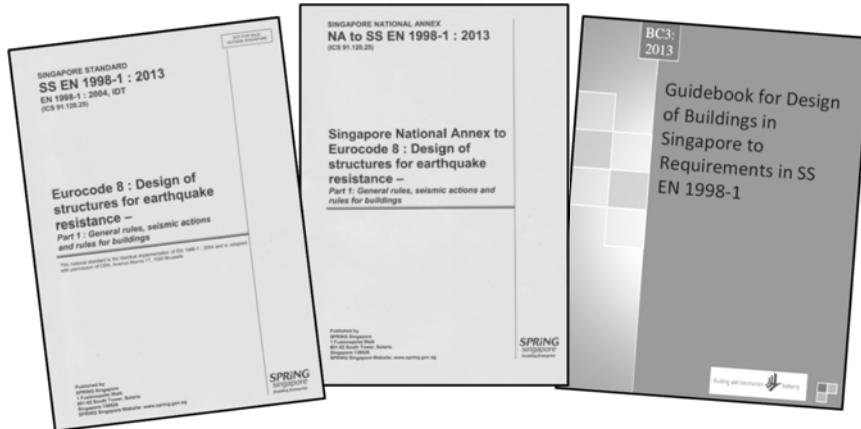
In-House Short Course for XYZ Consulting Engineers Pte Ltd (2014)

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Sessions 1 and 2

Day 1

Session 1:

- Basic concepts
- Single-degree-of-freedom systems
- Effective force due to ground motion
- Elastic response spectrum
- Multi-degree-of-freedom systems
- Mode superposition method
- Direct Integration method
- Characteristics of earthquake motion
- Effects of earthquakes on buildings
- Seismic design philosophy
- Demonstration examples of structural dynamics (SAP2000 / ETABS)

Session 2:

- Modelling of tall buildings
- Key features of finite element method (FEM)
- Eurocode 8 (EC8) for earthquake resistant design
- Relevant documents for Singapore
- Performance requirements – no-collapse and damage limitation
- Classification of ground type and buildings
- Reference and design seismic actions
- Design response spectrum
- Ductility and behaviour factor
- Demonstration examples by ETABS

Sessions 3 and 4

Session 3:

- General principles for earthquake design
- Structural regularity in plan and elevation
- Floor diaphragm action
- Choice of analysis methods
- Accidental torsion
- Lateral force method of analysis
- Distribution of seismic forces
- Modal response spectrum analysis
- Mass participation factors
- Distribution of modal seismic forces
- Modal combination and directional combination rules
- Displacement calculation
- Safety verification: ULS and DLS
- Second order effects
- Drift limitation check
- Minimum structural separation
- Demonstration examples of seismic analysis by ETABS

Session 4 (Hands-on)

- Hands-on examples of seismic analysis of tall buildings using ETABS
- Alternative methods of analysis
- Performance based assessment (introduction)