

SHORT GUIDE

FOR HOME OWNERS FOR BUILDING HOUSES USING REINFORCED CONCRETE FRAMED CONSTRUCTION

If you are intending to build a single or low rise multi storied residential building (less than 15 m in height) with reinforced concrete frame consisting of columns & beams, you need to do the following to make the building structurally safe against future earthquake hazards compliant with the Building Byelaws.

HIRING PROFESSIONALS

To build the house, you will need to hire the services of professionals, who are registered with the Municipal Authority. They should be fully conversant with the Development Control Regulations & Building Byelaws.

- a) Architect
- b) Structural Engineer
- c) Geotechnical / Soil Engineer.
- d) Construction Supervisor
- e) Contractor

THEY NEED TO CHECK THE FOLLOWING

- The land is not prone to frequent flooding.
- The soil is not soft and is not liquefiable. (This could be a problem particularly in the river bed and coastal areas).
- There are no known earthquake faults in your land or very close to it.

DOCUMENTS FOR APPROVAL OF BUILDING PLANS

After you have hired the professionals, you will need to get the following from them:

- Certificate of Undertaking by Architect.
- Certificate of Undertaking by Structural Engineer.
- Certificate of Undertaking by Construction Supervisor.
- Certificate of Undertaking for Hazard Safety requirements (to be signed jointly by Owner and the Structural Engineer)
- Structural Design Basis Report by the Structural Engineer
- Soil Investigation Certificate by the Geo-technical/Soil Engineer
- Certified copies of Building Plans
- No Objection Certificate of various authorities will be required before commencing construction. The Architect should provide guidance.

For **REINFORCED CONCRETE FRAMED STRUCTURES** you have to check the following points with the professionals that minimize the risk of damage in the event of an earthquake.

i. Check with the Architect

- That the building configuration follows the seismic safety norms by keeping the building form as simple as possible avoiding large projections, twist & turns in the building.

- That the building plan satisfies all the provisions in the Development Control Regulations.

ii. *Check with the Structural Engineer*

- That he has followed the Indian Standards IS 456 – 2000, IS 1893 – 2002 and IS 13920 – 1993, satisfying all earthquake resistant safety design requirements.
- That the structural frame plan satisfies the earthquake safety requirements, for example the major axis of about 50% of the columns is along each of the two principle directions of the building.
- That rational seismic analysis of the RC frame has been carried out including torsional effects.
- That strong column – weak beam design philosophy has been used.
- That appropriate ductile detailing has been used as per IS 13920.
- That detailed structural drawings have been prepared along with bar bending schedules for the various components of the building.
- That in the case of building on stilts / open plinth and / or with projecting upper stories with floating columns have been fully designed & detailed as per the above BIS Codes.

iii. *Check with the Geo-Technical / Soil Engineer*

- That proper soil investigation has been carried out for determining the safe bearing capacity.
- That the soil is not liable to liquefaction due to earthquakes.
- That the site is not liable to landslide hazard.

iv. *Check with Supervising Engineer*

- That he conducts testing of material samples to ensure good quality of materials & keeps a signed record of all test results in a bound register at the site available for inspection.