CHAPTER- IV

PRECAUTIONARY MEASURES, TO BE OPTED BY, PROPERTY OWNERS.

CHECKLISTS

OWNERS should follow the tips, for reducing the damages, in the event of earthquake strick. Further, to safeguard owner and owner’s family and owner’s 'Sweet Dream Home'.

GENERAL

a) Conform in which EARTHQUAKE ZONE your proposed home falls in: Either doing search through computer net search yourself or through friend who is aware about computer net search.

b) In the zones IV & V, the chances of more number of earthquakes, of different intensities and expected more frequently. Therefore the buildings in these zones must possess strength to resist, to the extent that, the building should not collapse, for the safety of occupants. The BIS Code (Indian Standard) no. 4326 guides for seismic i.e. Earthquake resisting techniques, read and try to check the construction procedure accordingly, in case of any difficulty ask structural engineer to inter vain for guidance.

c) In the zones IV & V, the chances of more number of earthquakes, of different intensities and expected more frequently. Therefore it is essential, so far as possible, not to construct the building or choose building for your sweet home, at locations mentioned below:

1) On the slope of hill,
2) Near the foot of hill,
3) On or near fault line,
4) Low lying areas,
5) On or close to the embankament of River,
6) In the building constructed on recently re-filled land,
In case of any doubt, do not hesitate to ask advice of Geo-tech. Engineer.

d) The push exerted during the earthquake on the building is instant and high in intensity, as well as it progress like a wave of water, i.e. the direction of force keeps on changing in upward and downward direction. The too long walls, and too high buildings, are dangerous for the building in the event of earthquake, avoid them.

e) The building experiences swinging action during the event of earthquake. It is essential the entire building act like a unit, to gain back its original position after the shock is over.

It is therefore essential to have uniform shape, the odd shapes would swing differently and harmony of unit action will be disturbed, calling for separation or collapse at such points.
THE PROFESSIONALS & HIRING PROCESS OF THEIR DUTIES, SERVICES. THE OWNER TO RECEIVE, CERTIFICATIONS AND THE UNDER TAKINGS OF THE PROFESSIONALS ON COMPLETION OF PROJECT.

The many professionals play a role in construction industry and they are as per there sequential entry in project,

1. Lawyer
2. Architect
3. Geotechnical Soil Engineer.
4. Structural / Civil Engineer
5. Project Engineer/Construction Supervisor/Project Management Consultants,
6. Contractor,

All the professionals, be registered with there respective government departments i.e. Bar council, Municipal corporation/Authority, and be well versed with the current D.C. RULES AND REGULATIONS and Bylaws of development.

1. Lawyer
The lawyer must verify all the documents of the land, should conform about the clarity of the title of the project land, and the legal part of the terms and conditions of tender and contract agreement.

2. Architect
The architect, to prepare building plan as per development rules and regulations, and Bylaws, submit it to the authority for the approval, along with his certificate of undertaking, do over all supervision of the project, on finishing the project get the occupation certificate from the authority.

3. Geotechnical Soil Engineer
The Geotechnical Soil Engineer to survey the land of the proposed project, teak the samples of strata, test the samples, workout the soil bearing capacity, conform the seismic zone, submit the detailed report in respect of construction of foundation and along with his certificate of undertaking.
He should specifically, to conform susceptibility of flood, in respect of location (If in vicinity of a river), and sand behavior in respect of water.

4. Structural/Civil Engineer

The structural engineer to design structure, based on the report of Geotechnical Soil Engineer, sufficiently strong, resistive to earthquake in compliance with seismic zone specified, in accordance with the updated IS Code's recommendations and specifications for the safety of occupants and structure. Further, he should issue certificate of undertaking of project, and prepare drawings showing details of reinforcement, and sizes of slabs, beams, and columns. Check the detailing on site from time to time and certify before concreting work of respective items.

5. Project Engineer/Construction Supervisor/Project management Consultants,

Is really the caption of the team, he submits certificate of undertaking of the project, gets executed the job of construction from the contractor, as per the IS Code's recommendations, specifications, practices and terms and conditions of contract.

6. Contractor

The contractor as per terms and conditions of contract arranges for labour and materials as per specifications, prepares the test specimens, gets them tested from the approved laboratories. In addition, executes the work as per instructions form site Engineer. Undertakes maintains responsibility as per terms of agreement (5 yrs. to 10 yrs).
The owner must receive following reports from the respective professionals

1. Report showing Basie of Structural design, from **structural engineer**, 
2. The Report stating findings from **Geotechnical Soil Engineer** about of investigation of soil and strata, 
3. Approved and certified copies of building plans, completion certificate, and occupation certificate, from **Architect**. 
4. **Project Engineer / Construction Supervisor / Project Management Consultant**’s, Undertaking on stamp paper by the appointed, of proper execution of project by him / her. 
5. Final bill of Quantities, undertaking of free service maintenance period, guarantee certificates of manufacturers e.g. water pump/s, Elevators etc. if any from **Contractor**
CHECKLIST, FOR OWNERS INTENDING TO CONSTRUCT (Stone/Brick) MASONRY BUILDING, LOAD BEARING (Without Concrete Beams and Columns) TYPE

1. Masonry walls cannot stand on their own, the push exerted by quake, vertical reinforcing bars embedded in the wall foundation are provided at the ends and at junctions of cross walls, which imparts the strength to building in regaining the original position or near original position. (4 bars of 10 mm dia. Bounded with 6-8 mm bar rings, @ 150 mm distance.)

2. Masonry needs bounding at top and bottom and at lintel level to act like unit. The top bounding serves dual purpose; it also bounds the roof with the wall. Bands if not provided, each portion will act independently, which is not desires.

3. Lintel level of doors and windows is same, i.e. to facilitate proper functioning of lintel band.

4. The door and window openings, be provided in the middle or near middle and total area in a wall should not be more than 50% of the wall area, as it weakens the strength of wall. To strengthen the weakness created by provision of openings, to be catered by providing reinforcement all around the openings.

5. The walls should be equal or near equal and placed in both directions when looked from top of the building.

6. Watering i.e. Curing the masonry be done for at least 8 days forgetting holiday. (cuing to be done on holidays, by making special labour arrangement)

7. The mortar of 1 cement to 4-6 of sand in proportion be used.

8. The material should be of good quality and testing to be done prior to using the same.
CHECKLIST, FOR OWNERS INTENDING BUILDING RCC FRAME CONSTRUCTION

1. Is the plan, prepared by architect, as per your instructions and requirements?
2. Has he attached certificate of undertaking along with the set of plan?
3. Is the certificate of undertaking and report from Geotechnical Soil Engineer attached with set of plan?
4. Is the certificate of undertaking and report from Structural Engineer attached with set of plan?
5. Is the certificate of undertaking by Project Engineer/Construction Supervisor/Project Management Consultants, attached with set of plan?
6. Is the plan scrutinized and seal of sanction affixed by the authorities?
7. Is the layout, made as per the sanctioned plan? Is it checked by architect and NOC issued by him for that effect?
8. Is the Project Engineer/Construction Supervisor/Project Management Consultants, or qualified engineer representative, attending the site in time daily? Is quality testing specimens sent for laboratory testing?
9. Is the excavation done up to the level, instructed by Geotechnical Soil Engineer? Is, NOC issued by him to that effect?
10. Is the foundation's reinforcement details checked by Structural Engineer? Is NOC, to cast the concrete in foundation issued by him to that effect?
11. Is Architect visiting the site once a week and/ or as per the requirement?
12. Is Structural Engineer visiting the site once a week, before and during concreting and/or as per the requirement, and controlling the quality of work?
13. Is monthly progress and work satisfactory report submitted by Architect and Structural Engineer?
14. Are the payment certificates, checked and approved jointly by the Architect and Structural Engineer?
15. Is final, work satisfactory completion certificate, issued by the Structural Engineer?
16. Is site cleaning done? Is, certificate issued by the Architect to that effect?
17. Is the application for NOC, for occupying the building submitted to the authority by the Architect, along with his final satisfactory work completion certificate?

18. Is NOC for occupation of building issued by the authority?
CHECKLIST FOR OWNERS, THOSE INTENDING TO PURCHASE, A NEW / OR RESALE FLAT IN MASONRY OR RCC FRAME CONSTRUCTION APARTMENT, OR SOCIETY, BUILDING.

1. Check the papers about the title and landownership of the land.
2. Check for the plans approved by competent authority.
3. Check for the structural engineer’s certification for safety of the building during the event of earthquake, of intensity as specified in the IS code, and for quality construction.
4. Avoid as far as possible building with, stilt parking.
5. Avoid as far as possible building with, odd shapes in vertical or horizontal directions.
6. Check for society registration, with concerned authority.
7. If its resale flat, then check for dampness, leakages, internally.
8. Check for cracks in plaster over masonry, flooring, beam, or column internally and externally.
9. Check for exposed reinforcement with rusting.
10. Check for general upkeeping of the building.
11. If its resale flat, check for owner’s membership status with the society.
12. If its resale flat, submit letter to the society, asking for NOC for your membership.
13. Register the sale deed, with registrar of cooperative society.

Check for transfer of electrical connection, water meter connection, pipeline gas connection, municipality’s property tax bill, in your name, prior to making final payment.