Awareness of structural design from Architecture point of view

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Construction Industry usually demands knowledge and deep understanding of both Architecture and Civil engineering for the development of project. These both are crucial disciplines that help in creating various types of structures.

Architecture is typically a practice of designing various structures by keeping esthetics and spacious functionality into consideration. Architect has the basic understanding of structural mechanics but they mainly emphasis upon look, feel and functionality of design. Structural vision starts in the field of Architecture.

On the other hand, structural engineering specializes in different structural elements of systems, ensuring that building can easily withstand in extreme loading condition. They works toward converting the vision of Architect into a realization. They deliberate on the physics which is involved in the construction process of the design of Architect.

In modern terms, **Purpose** is nothing but having a **vision and planning** the requirement. **Engaging** skill laborers is nothing but **hiring specialist consultant**. Having **patience** and **desire** for perfection is nothing but allowing for proper **construction practices.**

Structural design is a systematic and methodical study of the stability of the structure, strength and rigidity of structure to resist forces.

- The design takes care of durability issues like cracks, leakage, excessive vibrations and deflections.
- Analysis involves computation of forces in various structural elements based on the loads and then sizing this elements.

Loads are many which includes the gravity loads like the load from the self weight of slab and beams, the live load due to the occupants, the weight of the articles inside the building etc. These gravity loads are vertically downwards. Then there are other loads like wind loads and earthquake which acts horizontally to the building which makes the building sway laterally. The building is supported only at the base and is like a cantilever while resisting lateral sway.

It is very important to note that the occupancy loads varies depending on the usage of the building. Load on a residential building is different from that on a library or a shopping mall. Any building can not be designed for unlimited earthquake loads.

India is classified into various zones based on the historical data available for calculating the seismic loads. Also the main aim of seismic design is to bring the ductility at joints. In a worst earthquake, this will allow occupants to have time to evacuate before the collapse of the building since the failure will be gradual due to ductility.

A very careful finite element analysis using advanced software packages are employed by the structural engineers to analyze these forces and then design the member. So engaging a specialist structural engineer is very important and mandatory to execute the project as per the drawings.

This is the short brief that explains the importance of structural engineering where both civil engineers & architects are involved and it is a specialized path after completion diploma engineers, may be through on-job training and self explore.

About Author: **Milani Nandi**, Arch-2000 from North Calcutta Polytechnic, worked in Steel Plus; currently working at M/s Ashmi Engineering. She is having 18 years of working experience & specialization in structural design.