



CONSTRUCTION TECHNIQUE FOR TALL BUILDING

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ABSTRACT

Selection of various structure systems depending on project from elementary level, pre-construction stage to post construction stage. High-rise build forms are still in a developing or involving stage compared to any other building type which are further discussed in the document.

INTRODUCTION

Selecting a structural system for a high rise building is a complex, multidisciplinary process. No design project is the same; however, in the initial phase of evaluating different structural schemes, there are certain criteria that are common.

For every construction, it is necessary to plan the project technique at pre-construction stage. The structure system that is to be used with suitable form work with relevant equipment should be considered altogether to make the project cost efficient, make good use of time and increase the productivity of labour.

High-rise build forms are still in a developing or involving stage compared to any other building type. Due to the help of elevator and structure improvement in 20th century we are able to achieve further increment in the heights and floors of building. We can see a drastic



boom in high-rise demand for urban spaces which pushed the environment to grow vertical and compact.

There are many techniques available to designers like there are different type of structured system, formwork and equipment that can used in technique. Some of these techniques, have been used for decades in a variety of projects.

This paper will summarize, relatively briefly, some of the techniques that used by designers for tall buildings.

Current Scenario

With today's increased need for housing in big cities, there is a growing need for high-rise buildings. Tall, slender buildings are wanted for big cities where space is limited. The development of these buildings has not kept pace with the development of many other systems in society.

Need of topic

To find out present scenario and type of frame structure available today.

Aim

Study different type of Construction technique for Tall Building.

Objective

Find the type of technique,
Comparison of different type of technique,

Limitation

Restrict to structure technique,

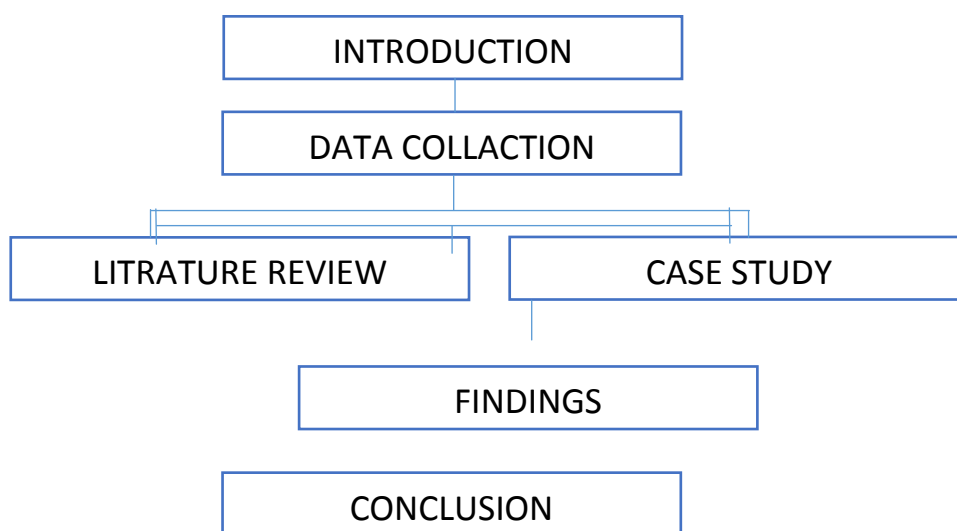
Need of the Study:

The high rise buildings are very different. So, the activities involved starting from the planning stage will impact the completion of the project. Other factors that favor this are:

1. Rapidly growing urban population that increased demand for tall buildings

2. To establish priorities for new research in this particular field.
3. The professionals must have the new information on high-rise buildings.

Mythology



Literature study 1-

Structural Steel Framing Options for
Mid- and High Rise Buildings

By Jason A. Cook

B.S., Civil and Environmental Engineering (2005)

Michigan Technological University

INTRODUCTION

Selecting a structural system for a building is a complex, multidisciplinary process. No design project is the same; however, there are certain criteria that are commonly true in the initial phase of evaluating different structural schemes. These criteria encompass all aspects of a full, functioning building, forcing the design team to be creative in their approach of satisfying all facets. An investigation was carried out for several structural framing options available to designers. The schemes describe how each successfully resist lateral loads explaining the advantages and disadvantages of each. Many of the structural design tools available for initial structural system evaluation are strength based. The demand for cheaper, more efficient and taller structures has paved the way for performance based design. Results



give recommendations for efficient structural solutions for proposed buildings as a function of height.

CONCLUSION

The evaluation criteria for the choice of a structural system can vary between projects. However, there are some criteria that are commonly used

1. Economics
2. Construction time
3. Construction risk
4. Architectural desires and structural needs
5. Local Constraints

Literature study 2-

The Stabilization of High-rise Buildings
By Christian Sandelin, Evgenij Budajev

In this report I study the type of load acting on skyscraper

INTRODUCTION

A building is exposed to a large number of different loads. They can be static or dynamic, come from outside or inside of the building. Simple categorization of them may be based on its direction; vertically or horizontally. Vertical loads, also known as gravity loads, generally consist of self-weight, live load and snow loads. Horizontal, or lateral loads, may occur in the form of wind load, tilt and seismic responses. Generally, the size of all these loads increases somewhat linearly with number of stories. The growth of the wind load on the other hand evolves differently and its effect intensifies rapidly with an increase in height. It is also the one which in most cases will be essential in the design of tall buildings - wind load as the main load.

CONCLUSION

All the loads act differently on various parts of the build form and hence more specific calculations are to be considered and combined to create an overall resistance from them.

Literature study 3-

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**METHODOLOGY FOR PRELIMINARY
DESIGN OF HIGH-RISE BUILDINGS**

By Viktor CastlenRist and Stefan Svensson

INTRODUCTION

Changes in society in recent years, related to urbanization, economics and architectural standards, have resulted in a greater interest for the construction of high-rise buildings.

When designing high-rise buildings, challenges are faced which often can be disregarded when designing lower buildings. These may include torsion of the building and swaying due to dynamic loads.

This dissertation will cover the steps to make in the preliminary design, when different options for structural systems are considered and rough dimensions are decided.

CONCLUSION

There are different type of structure framing system and technique that used by designers for tall buildings. Each system have its pros and cons, while selecting of the structure designer goes through the specification of structure and compare them

FINDINGS

	CASE STUDY-1	CASE STUDY-2	CASE STUDY-3
	THE LOFTS Blue Ridge	High Rise SKY Towers	Amanora Gateway Towers
STRUCTURE	SHARE WALL	OUTTRIGGER	CONVENTIOAL
HIGHT	284M	120M	150M
TYPE	RASEDENTIOAN L	RASEDENTIOANL	RASEDENTIOA NL
MATERIAL	RCC	RCC	RCC
FORMWORK	ALUMINIUM	ACS+GENERIC SLAB PANEL +STEEL COLOUM SHUTTERING	CONVENTIOAL +ALUMINIUM(c ore + stairs)+ LIGHT WEIGHT COLOUM SHUTTERING

STRUCTURE ADVANTAGES	Effectively resists lateral loads by producing shear wall-frame interaction system.	Effectively resists overturning moments by perimeter mega columns connected to the core with outriggers. Offers the architect more flexibility to articulate the unobstructed facade compared to tube type structures of similar height range.	Provides flexibility in floor planning. Fast construction.
STRUCTURE DISADVANTAGES	Interior planning limitations due to shear walls	Outriggers are obstructive inside the floor interfering with ceiling space thereby usually limiting their placement in mechanical and/or refuge floors.	Expensive formwork. Slow construction.
MATERIAL CONSUMPTION	MORE COMPARE TO CONVENTIONAL	LESS COMPARE TO CONVENTIONAL	-
SLAB CYCLE	10 DAYS	6 DAYS	15 DAYS
Not factor	Can be a major factor if the forms have to be built in site	Not a major factors, system can be used in restricted small sites	Not a factors
Crane time	Crane-dependent system, sufficient crane time is a must	Crane is used for materials delivery & concrete placing	Not a factor
Feasibility	EASY	MEDIUM	EASY

CONCLUSION

It is not easy to find out most effective universal structure system, because there is no structure which fulfill every requirement, every structure have its advantages and disadvantage. Some structure can built quicker than other ; some are expensive than other ; others may be stronger etc. but all of them have their own limitations. Selecting formwork

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firstly depend upon the design of the building. Time, experience, challenges also play an important role in selection of the structure.

Nearly all the criteria to follow have a direct link to the economics of a project. The property itself can influence while selecting the structural system. There are many innovation are taking place in structure system as a construction manager we need to keep up with it.

Mostly companies prefer to use the construction techniques they are familiar with or have been used by them in previous past works with regards to their machinery methods or they won't have to train the labours again for the same work.

Usually in big projects we consider function as of greater importance but when we stack the building resulting in a vertical circulation we reevaluate the services running across the built form which results in a much more convenient building.

Recommendations

The below stated recommendations are more appropriately valid for Pune city.

Use of advanced BIM software's like E-TAP which makes the project time efficient, they also offer different risk analysis of the structure proposed, and quantification of materials that will be used in construction. This also helps in an easy to do detailed estimation of the overall project.

Composite structures, that use steel with concrete for instance, should be more often practiced this method opens gateway to adopt new techniques in future.

A specific formwork can be used to make typical elements of a building such as staircase and shafts which is repetitive throughout the building.

There are many new structure designs like outrigger, megatube that can be achieved by present machinery and labour skills.

The construction industry needs to adopt new construction techniques and technologies, which will increase their demand in the market and make new techniques more economical and hence widely acceptable.



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