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The Gujarat Institute Of Civil Engineers & Architects (GICEA)

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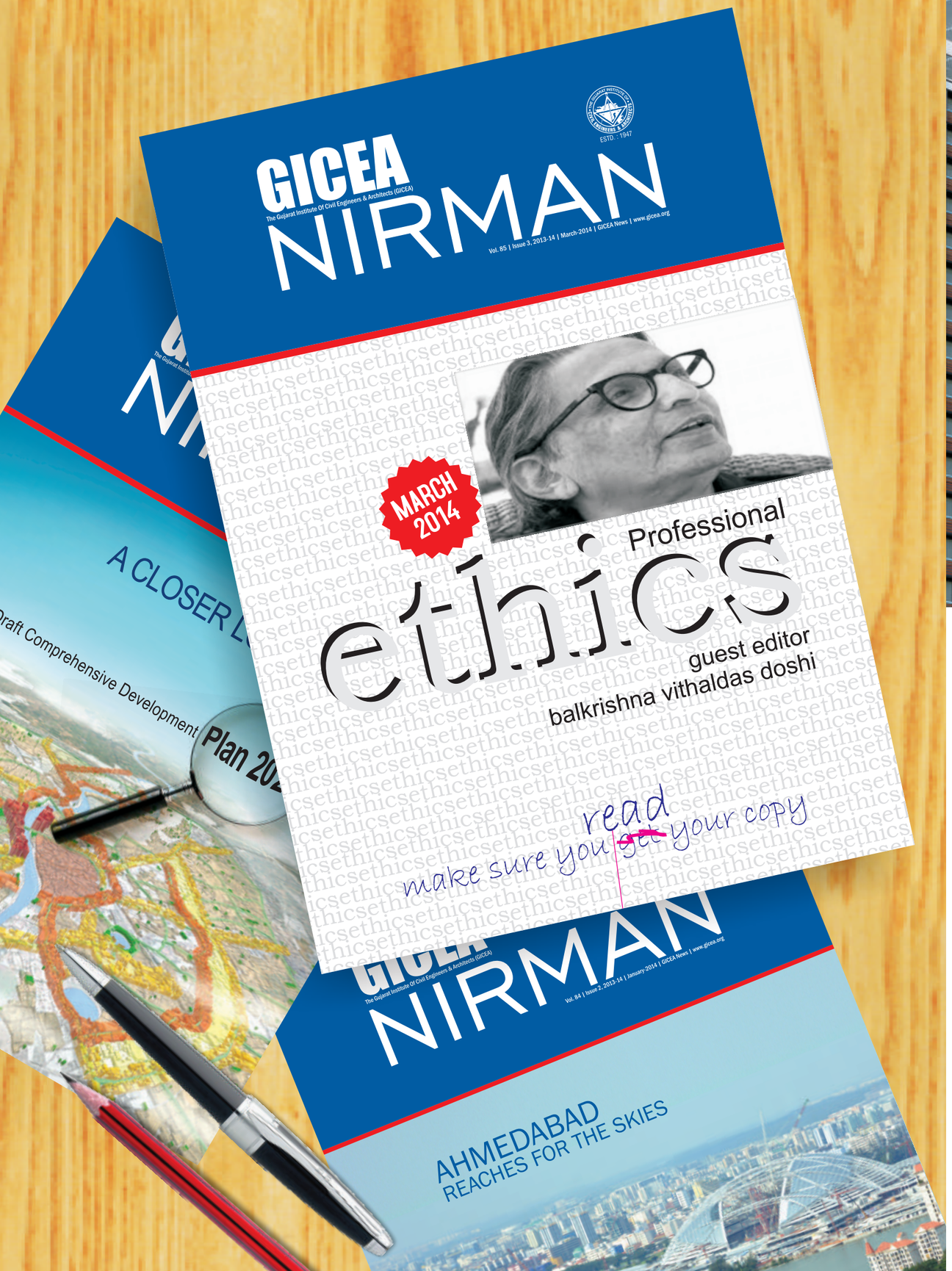
AHMEDABAD
REACHES FOR THE SKIES



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Index

Cover Photograph "Singapore Skyline"
Courtesy Mr. N.K.Patel from his collection of Photographs taken on technical visit to Singapore

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PRESIDENT'S MESSAGE

It is the beginning of the year and it is in order - though a little late - to wish all the members a very eventful and happy 2014. The New Year indeed promises to be the harbinger of sweeping changes in the way we plan, design, and build. There is a palpable undercurrent of thrill and purposefulness all around as civil engineers , architects, planners, builders and contractors gear up to participate in the construction of tall buildings that are to soon mushroom in Ahmedabad.

Our previous issue dwelt upon the Draft Comprehensive Development Plan 2021, which has been the game changer of the future realty market of Ahmedabad. This month's issue "Ahmedabad Reaches for the Skies" explores the tall buildings scenario with relevance to Ahmedabad. The subject is of immediate interest due to the GDR announcement that henceforth permits construction of buildings up to 70 meters height henceforth.

I thank my good friend ,neighbor and business associate of long standing Mr. Pankaj Dharkar for his keen interest in developing the theme of this issue and for allowing the magazine to borrow his contacts with the deep Mumbai fraternity of architects, engineers and Project Management Consultants. Thanks are due and offered to our Vice President Mr. Nitesh Shah whose hectic efforts have contributed immensely to this issue.

As usual we have been the beneficiaries of the untiring and indispensable guidance of our ex-President Mr. N. K. Patel, who in the truest sense is the mentor of this magazine. Last, but not the least, my sincere thanks to the advertisers who have put their faith - and money - in this fledgling project.

Even as Ahmedabad reaches for the skies there is need for us to have our feet planted firmly on the ground. Whilst there is no dearth of technological advancements , human and financial resources available with us to build tall , we - in Ahmedabad - will have to unlearn many of our lackadaisical ways so that we do not fall short of the expectations of the public at large when we go about building tall.

AR. ANAND TATU
President, GICEA

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Editorial Team

AHMEDABAD REACHES FOR THE SKIES

Though it may be a late entrant in the tall buildings race, Ahmedabad's mood is buoyant and not the least deterred by the catching up it has to do in terms of upscaling its construction sector and entrepreneurial bandwidth.

But the race to build tall has always been on. Within the span of just two years, the world's tallest building was built three times in New York City - the 282.5-meter Bank of Manhattan in 1930, the 319-meter Chrysler Building in a few months after, and then 11 months later the 381-meter Empire State Building in 1931. The era of architectural horse-racing and ego-boosting has only intensified in the decades since. In 2003, the 509-meter Taipei 101 unseated the 452-meter Petronas Towers in Kuala Lumpur after a seven-year reign as the world's tallest. In 2010, the Burj Khalifa in Dubai far surpassed Taipei 101, climbing up to 828 meters.

Now, that Ahmedabad has entered into the category of middle-income cities and is further likely to enter into the club of high-income cities by the next decade there is recognition of the need to increase the density of commercial development. The sustainability benefits of high density are relatively well known. For example, less urban sprawl means less need to use green field sites, more use of public transport and with mixed use developments, a reduced need to travel.

In order to understand why the world's fastest growing cities are built at high density, often favouring commercial tall buildings, we need to understand why we have cities in the first place. Businesses cluster together in cities because there are clear commercial benefits from doing so, and they will continue to do so as long as those benefits outweigh the congestion and cost often associated with doing business in cities.

Massive developments are difficult to design and build. There's something exhilarating about a tall structure that makes a mark for a city and a region yet when they do happen, it's generally because two important factors came together to make building up pay off: egos and economics.

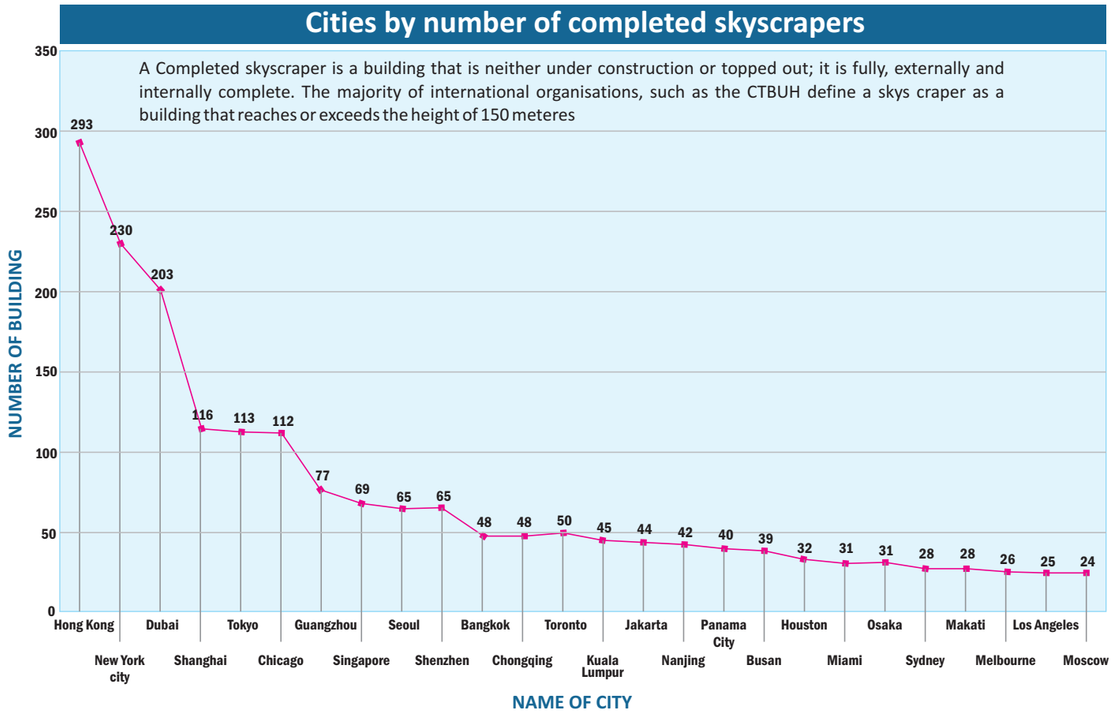
What do we mean by 'high commercial density'? It's very difficult to define, and it varies with context in different cities. Most people recognise and understand high commercial density development to mean exceeding the equivalent of 20,000 jobs per square kilometer in an area. This level of jobs would generally require multi-storey buildings, and virtually all land devoted to the built environment and supporting infrastructure (such as roads).

Will these parameters drive the construction of tall buildings in Ahmedabad or will it be the attention the organizers hope to attract amongst their peers in the realty market. Be that as it may, the future dominance of these buildings within the city is a reflection of Gujarat government's desire to change the skyline and profile of Ahmedabad through the presence of tall buildings. The Gujarat government in fact has led by example with its own very tall GIFT city.

One cause of concern remains: Ahmedabad has been experiencing almost unprecedented levels of speculative development. Although construction levels in the city has been high over the last five years, the majority of built-space is either pre-sold to investors well in advance or remains unsold. Thus, the role of the investment market is therefore likely to be critical in supporting the development of a tall building scheme.

Let us hope that active demand picks up and remains healthy with interest from a diverse range of sectors. Attracting occupiers will of course depend on a number of other variables apart from the height of the building, the most one being confidence in the future of the realty market of Ahmedabad.

But the race to build tall has always been on. Within the span of just two years, the world's tallest building was built three times in New York City - the 282.5-meter Bank of Manhattan in 1930, the 319-meter Chrysler Building in a few months after, and then 11 months later the 381-meter Empire State Building in 1931.



CHALLENGES IN TALL / SUPER TALL BUILDINGS IN INDIA

Jairam Panch

A CEPT post graduate, Jairam Panch has an overall industry experience of 25 years in both domestic and international markets. Jairam has worked on challenging project segments such as retail, residential, hotel, commercial, industrial, high rise buildings, interiors and urban planning projects including Burj Khalifa development. He joined Turner as an Assistant Engineer and currently heads Turner India as Managing Director. Turner India is currently managing projects worth approx. 4500 Cr. with a staff of 120+ located in Delhi, Mumbai and Ahmedabad. Jairam has laid out ambitious expansion plans for the company and positions Turner as an industry differentiator in India.

Introduction

The definition of high rise buildings is generally understood to mean buildings above 35metres in height or more than twelve floors. Currently, many buildings in India fall under this category. However, tall / super tall building construction (>100 metres) is slowly becoming the norm in many metros in India.

At a height of 254 metres, the tallest constructed residential building (in India) is the Imperial Towers, Mumbai. Demand for quality residential housing in South Mumbai, along with an increase in floor space index (FSI) and favorable Development Control Rules (DCR), has permitted developers to invest in mill lands of Mumbai city and develop them into premium residential housing zones. While this may not address the ever-increasing housing problem in the city, it will provide quality housing to the high-end segment, and in the process, demonstrate engineering and construction expertise in erecting iconic landmarks equivalent to the world's most developed cities.

While there are challenges in obtaining timely approvals and permits, evaluating seismic conditions, etc., the Indian skyline is destined for a change in the long run. It is probably fair to assume that there are at least 50 residential tall towers under construction in Mumbai alone that are more than 100 metres tall. Among these is World One, which is expected to be the tallest residential tower at 442 metres when completed. As with Mumbai, Delhi, Kolkata and Bangalore are also going vertical.

Tall building construction presents many challenges to developers and professionals, and the thoughts presented in this paper are generic and applicable to all types of tall / super tall building construction.

Challenges

There are various design challenges associated with tall building construction. Architecturally, challenges relate to the form, shape, design of core and floor plates, aesthetics, façade design and compliance with local codes, sustainability, etc. In this regard, it is critical to achieve design efficiency and maintain the right density. Structurally, the design of foundations and substructure, be it a steel, concrete or composite construction, selection of high-strength concrete (60 to 100MpA), and the use of curing agents and reinforcement couplers are all key considerations. Historically, many tall buildings were steel buildings which permitted quick construction as most of the members were prefabricated off-site and assembled at site using cranes and other equipment. However, there is a growing trend towards composite buildings (steel and concrete). Burj Khalifa, currently the world's tallest building, is primarily a concrete building with steel components comprising its spire.

Wind Tunnel Testing

Wind tunnel testing must be performed at preliminary stages of design to determine the effect of wind and lateral forces on the building. The wind tunnel result can impact the design, shape and orientation of the building. There are reputed agencies in India and abroad that provide wind tunnel engineering services. It is also important to have tall buildings designed to comply with the latest international earthquake resistant codes and standards. Typically, it is the lateral forces imposed on a high-rise building by wind that govern the structural design.

Taipei 101 , formerly known as the Taipei World Financial Center, is a landmark skyscraper located in Xinyi District, Taipei, Taiwan. The building ranked officially as the world's tallest from 2004 until the opening of the Burj Khalifa in Dubai in 2010. In July 2011, the building was awarded LEED Platinum certification, the highest award in the Leadership in Energy and Environmental Design (LEED) rating system and became the tallest and largest green building in the world.

The Indian Local Codes and Standards

The Indian local codes and standards, governed by National Building Code and other agencies, address high rise building design only partially as yet. Many international consultants involved in the design of tall buildings in India adopt American or British standards which have been used, tested and amended as appropriate over many years.

CHALLENGES EXIST IN THE DESIGN OF services such as mechanical, electrical, plumbing and fire fighting systems. Tall buildings present formidable challenges in meeting fire protection and prevention measures. Constant state of preparedness to deal with any emergency situation is extremely critical for within the building as well as by the fire fighting authorities. Developers should ensure that adequate competent fire fighting snorkels, as well as fire protected areas of refuge, are available to fight any eventuality.

The Design of Vertical Transportation

The Design of vertical transportation systems is critical in terms of selection of the right sized elevators, travel time, speed, elevator shaft sizes, understanding peak hour traffic, availability of continuous power with 100% back-up, availability of on-site support in case of any major breakdown, availability of spare parts within the country, excellent after sales service and a competent technical team which would manage the facility post construction. Certain elevators can be programmed to permit controlled evacuation for certain fire or security events in some tall buildings.

Proper Logistical Planning

Proper logistical planning is key to a successful high-rise project. Efficient construction can only be achieved by proper control of the flow of materials and manpower in and out of the site. This is particularly challenging when constructing a tall building in dense, urban city center settings. Some of the key logistical challenges that arise include phasing, deliveries, material and transport / stacking / traffic movements (inside and outside plot boundary),

Turner's Expertise in Tall Building Construction

Turner has built or managed 12 of the world's 100 tallest buildings (including Burj Khalifa, UAE and Taipei 101, Taiwan) and is fortunate to have been selected to manage the world's tallest statue – Statue of Unity at Kevadia.

Turner brings in the best management practices from its international experience and works with all project stakeholders to deliver projects to international standards and raise the project delivery benchmark in India.

The Statue of Unity is an under planning 182 metres (597 ft) monument of Vallabhbhai Patel that will be created directly facing the Narmada Dam, 3.2 km away on the river island called Sadhu Bet of Narmada river, near Bharuch in Gujarat. On completion, it will be the tallest statue in the world.

workforce, transport and evacuation, egress and welfare provision, and temporary power and water.

Project Management

The Project Management and construction management of tall buildings presents greater challenges from the inception of the project. It is extremely important to engage the services of an experienced project management firm right from the preconstruction stages of the project. Availability of an experienced task force and knowledge of critical elements that can impact the construction and hence achieve efficient planning is a key driver of successful project management of tall buildings. Constructability reviews must be performed during the preconstruction stage to understand the challenges with regard to engineering, availability of materials, standardization of elements, local market conditions, labour availability and competency, selection of construction equipment – hoists, tower cranes, scaffolding, form work, slab cycles, prefabrication yards, material storage, dedicated batching plants and material testing laboratories.

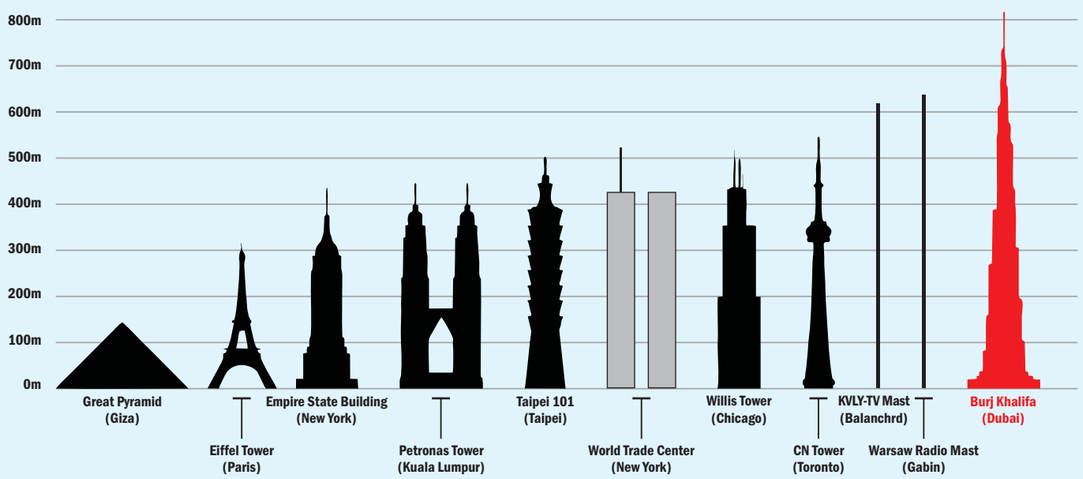
Critical Quality Parameters

Among the critical quality parameters which must be checked and corrected (if required) at all times is maintaining "verticality" of the building, within the tolerance limits. Any out of tolerance situation, whether related to verticality, creep / shrinkage, deflection or otherwise, can have an immediate and serious impact on subsequent critical path installations, including elevator shafts, slab edges, curtain wall, and services installations. Therefore, adequate attention must be given to ensure the highest levels of surveying and quality control at all times.

Safety Compliance

One of the major challenges faced during the construction period of tall buildings is achieving 100% safety compliance. Construction sites must have the highest level of safety standards. The Owner must drive this mandatory requirement so that other project stakeholders – Consultants, Contractors and Sub-contractors –take the matter seriously. This can be achieved by enforcing compulsory PPE wears, imparting regular hands-on training to workmen, improving supervisory skills and increasing the supervisors to workmen ratio, ensuring that all temporary vertical transportation equipment are checked and certified by competent third-party agencies, housekeeping, working at heights, safety nets, periodic audits, etc. ▪

Burj Khalifa compared to other landmarks.



IT IS ONLY AFTER HAVING WORKED ON TALL BUILDINGS THAT THE COMPLEXITY OF IT ALL SINKS IN.

Qutub Mandviwala

An alumni of Rachana Sansad College-Mumbai, Qutub Mandviwala graduated from the Academy of Architecture-Mumbai in the year 1988. He established his own office, MQA (Mandviwala Qutub & Associates) two decades ago & is its principal architect

Awards

1) Indian Achievers Award For Construction & Design (2009)

2) Bharat Gaurav Award with Gold Medal for Outstanding Contribution to National Development

3) Bhartiya Nirman Ratan Award (2009)

4) Asia Pacific International Award for Best Mixed Use Development (2010)

5) Artist in Concrete Award 2011 (National Level)

6) Architect of the year Award 2013 by CNBC

Introduction

That Ahmedabad is growing tall, is a welcome move. Historically, Ahmedabad has developed by growing out of the walled city. Initially all the main roads and markets were confined to the wall city ; Relief Road, Gandhi Road, Manek Chowk and Ratan Pole are examples that come straight to the mind. Expansion of the peripheral areas began in the 1980s and has continued since then. Earlier only the Eastern parts and particularly the Eastern periphery registered faster growth rate, but since 1980s even the Western periphery has grown rapidly as, Ahmedabad spilled out westwards to CG Road and then S.G. Highway. Now, we have the Sardar Patel Ring Road as an outer boundary within which the city will develop. Thus, rather than grow vertically Ahmedabad has so far chosen the path of horizontal growth.

Now, there is a move to grow vertically; and it is a good thing too! There are limits to horizontal expansion and Ahmedabad has realized that it has reached those limits. This is a welcome move. It is the right decision at the right time.

Two cities: the old & the new

Actually, Ahmedabad is two cities: the old walled city and the other modern one around the walled city that has expanded continuously. What should happen is that the walled city should be encouraged to maintain its traditional character and its pols and streets should be retained as they are. My personal experience of staying in a pol in Kalupur has been a pleasant one. The houses are big, roomy, and foster close-knit neighborhoods. They are architecturally and climatically sound. Even in the earthquake of 2002, nothing happened to these pol houses but the newer buildings outside the walled city did not fare as well and in fact tumbled down by the dozen. The walled city is Ahmedabad's proud heritage and should be showcased as one of Gujarat's heritage locations. In the meantime, the modern city – especially the affluent western suburbs – should take the path of aesthetic, modern, urban culture, and the new wave of taller buildings that are to mushroom soon in Ahmedabad.

In Greece I saw a similar case in the medieval town of Rhodes, which is on the list of UNESCO World Heritage Sites. There is an ancient medieval town and there is this modern city. The medieval town attracts the tourists and is the backbone of the modern town's economy. The medieval part of the town is preserved as it is, retaining intact its old world charm and historical dignity. The modern city on the outside grows unhindered as a top tourist destination.

Higher FSI - Sabarmati Riverfront Development & the BRTS

The Sabarmati Riverfront Development is an excellent starting point for developing an iconic skyline for

5th SEASON, a project by Qutub Mandviwala at Mulund. 6 of 42 storey's tower designed to give each apartment luxury of living and infinite panoramic views of the Eastern express highway and Western hills of the suburb of Mulund.

Ahmedabad but rather than having a Bang Upfront 5.4 FSI at Ashram road, I would prefer a tapered rise of heights – like we have at Marine Drive in Mumbai - with the shorter buildings nearer the river and the taller ones behind the shorter ones. This way the river view will be visible to the shorter as well as the taller buildings. Also, the people coming to the waterfront will not be over powered by a high "wall" of buildings. The scaled heights will be a welcome sight and make the river front the "WOW" factor of Ahmedabad.

The Ashram Road area should have a mixed-use pattern instead of a CBD. This would allow people staying here to permanently enjoy the riverfront view just as is the case with the Thames riverfront in London.

Looking at Ahmedabad's wide roads and looking at the fact that the BRTS will need other "feeder" services to be really useful, it makes more sense to give similar FSI to all roads of that are of a certain minimum width and let the taller buildings come at the appropriate junctures as decided by the town planners. This is going to happen, just as it has in London and New York. The complimentary services of AMTS and Metro rail together with the BRTS will form a "complete" network for commuters to crisscross across the city and this network must have similar FSI rather than singling out the BRTS for the tall structures.

Practice Makes Man Perfect

Designing and planning for tall buildings is different from your normal tenements / row-houses / bungalows, four-storey or twelve-storey structures we see in Ahmedabad.

When you design a tall building, you do not design the spaces alone; a whole host of other parameters comes to the forefront. You have to keep in mind the structural concerns, the seismic loads , the flight paths and the wind-velocity-factor. You have to keep in mind the orientation of the building, the aspect ratios. For tall buildings, the aesthetics of the exterior finishes is very important, unlike a bungalow or four-storey building that you just paint and come out. The finishes for the taller buildings have to be of a more permanent nature. You cannot keep maintaining the exteriors of a forty storey building as the repair works are complicated and costly. This is a part of the learning curve. You only realize after ten years, the impact of the mistakes or otherwise that you have committed.

When you take tall buildings, they become very 'form' oriented and 'view' oriented buildings. A look at the building in Dubai will suffice as an example.

These things – in their entirety – are not so much a matter of academics but rather a matter of daily practice. As is rightly said, "Practice makes man perfect". It is only after routine and regular practice, day in and day out that all of these multiple layers become an integral part of your system. Designing buildings up to, say, 40 meters is – relatively speaking – simpler and all these factors not entirely accounted for.

A tall building is a collaboration package. The design and planning of a tall building is a package. You have to have all the consultants working together in a grid and all of whom have to be given equal weightage. Moreover, they must be on-board right from the day you start.

A tall building means high population density. This means that parking takes a serious dimension. Just providing a couple of underground parking lots will not suffice; you will have to incorporate more than a single podium on top. How to create ramps, driveways, podiums and the parking spaces is a crucial corner stone of the tall building design project. There will have to be made for stricter fire prevention/fighting norms, for Refuge areas. There will be service floors that will come in the buildings. There will be sewerage treatment plants.

It is only after having worked on tall buildings that the complexity of it all sinks in. It is not difficult; but it takes time. More importantly, it will take time for the Realty markets of Ahmedabad to wake up to the costs, complexities and entrepreneurial bandwidth required for the construction and successful marketing of tall buildings.

Is Ahmedabad ready?

The construction cost of a building is much higher than your usual buildings and may be the factor that will inhibit their growth in Ahmedabad. I do not know how the Ahmedabad Realty market will absorb the costlier tall buildings. As a thumb rule, the construction cost of a tall building is about Rs. 5000 per square foot (including interiors of the building and not the individual offices) and I presume in Ahmedabad it may be somewhat lower - say about Rs. 3500. After adding the land costs, interest, development charges etc., will Ahmedabad have takers for this kind of costing? It remains to be seen.

SIGNIA HIGH a project by Qutub Mandviwala at Borivali , Mumbai, A 171.00 mtrs tall high end residential building with unobstructed view of National park and an exclusive viewing deck area at top level.

This could be a blessing in disguise for the existing buildings, in as much as the new tall buildings will jack up pricing! The Ahmedabad Realty markets will wake up to new costing norms.

Now, if, let's say a new tall building comes up in the neighborhood with premium prices, the surrounding buildings will automatically see a jump in their values. Therefore, in my area if a new building is coming up at Rs. 7000 per square foot then why should I sell at Rs. 3000, even if it is a four-storey building? At least I will hope for Rs. 4500/- if not more.

As far as technical expertise goes, Ahmedabad boasts of some of the top architects. Whatever little they lack by way of experience in construction of tall buildings can be covered in the next few years.

Demand Supply

It will be the Realty market of Ahmedabad and not technical or financial restraints that will hold back the construction of tall buildings in Ahmedabad.

Ahmedabad has no daily influx of additional population as is the case with Mumbai. In Ahmedabad, land is available aplenty and there is room enough for all, even without the taller buildings. The compulsion of land price and land scarcity that has been the driver for the skyscrapers of Mumbai is not really the case with Ahmedabad. At this point, at least, Ahmedabad is not cramped and old habits of low-rise horizontal expansion is not going to fizzle out soon, if not ever. Another dampener for the tall building scenario of Ahmedabad is that the social elite of Ahmedabad prefer staying in bungalows in quiet far-flung suburbs.

I am not sure if demand supports tall buildings in Ahmedabad. In my opinion, frankly speaking, there is little market compulsion for tall buildings in Ahmedabad. Though it may be fashionable to go for tall buildings, how long will you keep these glass houses empty? Are all residential and commercial complexes of Ahmedabad fully booked? Fully occupied? Today, commercial properties are not selling even in Mumbai. We have huge chunks of properties at Bandra-Kurla Complex that we are still unable to sell. This is a trend running all across India and elsewhere too.

Nevertheless, as I mentioned earlier, there are limits to horizontal expansion and Ahmedabad has realized that it has reached those limits. How long can you keep gobbling up fertile farmlands and stretch the already overburdened existing infrastructure of the city? Ahmedabad will have to reach for the skies and it will do so sooner rather than later. As an architect having designed umpteen tall buildings, I look forward eagerly to contribute to the rising skyline of Ahmedabad city. ■

20 Tallest Completed Buildings In The World

No.	Name of Building	City	Height (Meter)	Height (Feet)	Floors	Completed	Use
1	Burj Khalifa	Dubai	828	2717	163	2010	Office / Resi./ Hotel
2	Makkah Royal Clock Tower Hotel	Mecca	601	1972	120	2012	Other / Hotel / Multiple
3	Taipei 101	Taipei	508	1667	101	2004	Office
4	Shanghai World Financial Center	Shanghai	492	1614	101	2008	Hotel / Office
5	International Commerce Centre	Hong Kong	484	1588	108	2010	Hotel / Office
6	Petronas Tower 2	Kuala Lumpur	452	1483	88	1998	Office
7	Petronas Tower 1	Kuala Lumpur	452	1483	88	1998	Office
8	Zifeng Tower	Nanjing	450	1476	66	2010	Hotel / Office
9	Willis Tower	Chicago	442	1451	108	1974	Office
10	KK100	Shenzhen	442	1449	100	2011	Hotel / Office
11	Guangzhou Inter. Fin. Center	Guangzhou	439	1439	103	2010	Hotel / Office
12	Trump Inter. Hotel & Tower	Chicago	423	1389	98	2009	Residential / Hotel
13	Jin Mao Tower	Shanghai	421	1380	88	1999	Hotel / Office
14	Princess Tower	Dubai	413	1356	101	2012	Residential
15	Al Hamra Tower	Kuwait City	413	1354	80	2011	Office
16	Two International Finance Centre	Hong Kong	412	1352	88	2003	Office
17	23 Marina	Dubai	393	1289	90	2012	Residential
18	CITIC Plaza	Guangzhou	390	1280	80	1996	Office
19	Shun Hing Square	Shenzhen	384	1260	69	1996	Office
20	Empire State Building	New York City	381	1250	102	1931	Office

This list was compiled on Monday February 3, 2014 from The Skyscraper Center.
Please refer to the CTBUH website at http://criteria.ctbuh.org for criteria on how to measure tall buildings.

PROJECT MANAGEMENT IS THE INVISIBLE LAYER MANAGING THE PROJECT

Project Definition: A project is a large or major undertaking, especially one involving considerable money, personnel, and equipment. It is a collaborative enterprise that is carefully planned to achieve a particular aim

A. B. Dongre

Dongre Associates was established in Vadodara in 1987 by A. B. Dongre when he returned from Sharjah, UAE, after almost a decade of valuable experience as Project Manager with vast and varied civil engineering projects. A.B. Dongre is a qualified civil engineer from Nagpur University and as a fresh graduate, worked with Gannon Dunkerley & Co. Ltd. Here the projects ranged from Bridges, Chemical Factories, Turbine Foundations for Thermal Power Stations, Water Treatment Plants, RCC Cooling Towers, and Textile Mills.

At Sharjah, he managed the construction of a huge Sports Complex housed under a covered Dome with an Olympic-size Football Stadium, a 6-track Racing Stadium, and a Club House, co-ordinated the construction of the 320-bed Sharjah General Hospital and was project manager for the construction of a 12-storey high-class apartment suites for HH, the ruler of Sharjah.

Dongre Associates offer services as Project Managers and Quantity Surveyors at Civil Construction Projects. The company has successfully executed more than 600 prestigious projects in the last 25 years.

It is indeed a welcome move that the GDR permits construction of buildings up to 70 meters height in certain areas of Ahmedabad city; this will inject fresh dose of confidence and vigor to the sluggish Realty market conditions prevailing there.

Role in GIFT

The lead for building tall has been taken by the Gujarat government itself with the announcement of GIFT a globally benchmarked International Finance City with an eventual built on area of 85,000,000 sq ft. The idea of GIFT was developed during the Vibrant Gujarat Global Investor Summit 2007 and is being planned by East China Architectural Design & Research Institute (ECADI), which is responsible for planning much of modern day Shanghai.

We are the Project Management consultants for the two completed towers so far. One – QC-1 – has been constructed by L&T Construction Building & Factories and the other –QC-2 _ by ANC Contracting India Pvt. Ltd. from Dubai. Both have been constructed under Design and Develop project wherein the building contractor develops the design but gets it checked by another Proof Consultant. We were the third party project management consultants for approving whether everything was as per drawings.

What GIFT is doing is that it is leading by example. The stated philosophy for construction of GIFT is "To design a CBD that will serve as a paradigm for Next Class city in terms of quality of life, infrastructure and ambience aiming to be high-density and high-rise, treating land as a precious resource." Yet, it remains to be seen how much of the GIFT experience will spill over to the Ahmedabad's construction sector and whether Ahmedabad's learning curve of the construction-of-tall- buildings will benefit from GIFT. What GIFT will definitely do is that it will add tremendously to Ahmedabad's infrastructure and reframe its outlook on built space.

A small story of a Red-Indian Chief

Can large construction projects be run and completed

without a systematic project management consultancy?

A small Yes but a big No!I am reminded of a famous project management story that I will relate:-

There was an old Red-Indian chief in the USA who claimed 100% success with his rain dance. He claimed that whenever he did the rain dance it rained. This was very intriguing and a Howard University graduate decided to investigate. He went to the chief and asked him, “is it true that it rains every time you dance?” The chief said yes it is true. The Howard graduate asked, “How do you do it?” The chief replied, “It is very simple! I keep dancing till it rains!!” The moral of the story is that we also complete the projects like the Red Indian chief, by keeping on with the project till it closes.

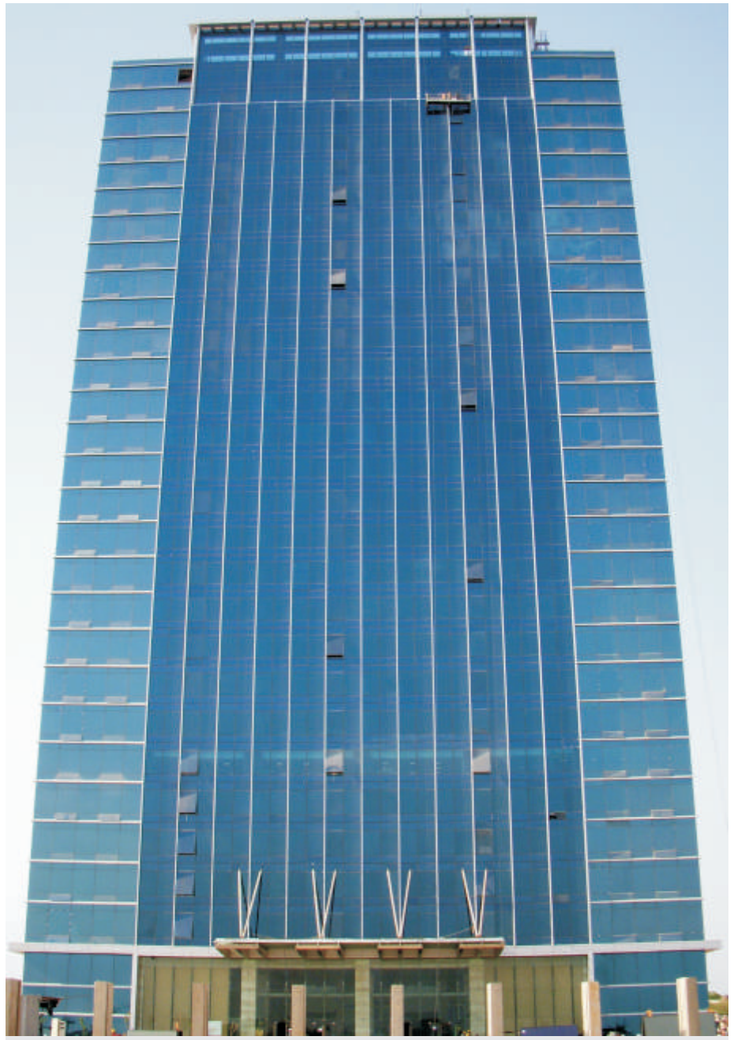
Project Management Consultancy

Though the stated brief of project managers is to monitor and occasionally herd projects , many times we are basically driving the project. The situation on the ground, being what it is, just monitoring does not make sense! After all, we are supposed to ensure that the job is done within a specified period meting the specified, designed and technical parameters of drawings and costs agreed upon.

The difference between Project Managers and Project Management consultants is that the consultant firms – especially the large firms from abroad – is that they merely dispense advice. In addition to this, they are also monitoring the project progress using charting software and other tools. In brief, they keep the stake holders updated about the project status and maintain records immaculately. On the other hand we see our roles as proactive drivers of the project and I believe that is what is needed to get the job completed as technically required, within time & cost.

I always hear from clients, “We don’t need a project management consultant. They just come and give us advice about things we already know and do little else. We want someone who will get involved and take ownership of the project. Who will take the required steps to keep the project on track during day to day construction and shall be with approved technology, time & cost and get back on track in case of delay.”

That is what we do. We drive the project by hands-on supervision and on-site presence. Rather than saying that we are the appointed project consultants we believe in saying it is our project.



Currently, two commercial towers, each of 29 floors each are completed. Of the two, QC-1 (*shown above*) – has been constructed by L&T Construction Building & Factories and the other –QC-2 by ANC Contracting India Pvt. Ltd. from Dubai. Dongre Associates is the Project Management consultants for these two completed towers.

Gujarat International Finance Tec-City (GIFT) will be built on 986 acres of land. Its main purpose is to provide high quality physical infrastructure (electricity, water, gas, district cooling, roads, telecoms and broadband), so that finance and tech firms can relocate their operations there from Mumbai, Bangalore, Gurgaon etc. where infrastructure is either inadequate or very expensive. It will have a special economic zone (SEZ), international education zone, integrated townships, an entertainment zone, hotels, a convention center, an international techno park, Software Technology Parks of India (STPI) units, shopping malls, stock exchanges and service units.

The estimated cost of the entire GIFT project is Rs. 70000 crores.

Ahmedabad

I think it is not an inaccurate assessment of Gujarat construction culture when I presume that it operates at an old customary (low-technology), indifferent for quality control and unscientific approach and management principles. Of course it may suffice for bungalows, tenements and the ground plus three or four storey buildings which are more or less the prevailing norm.

It is very deplorable that even though Project Management is the invisible layer that drives the project, in Gujarat Project Management Consultancies are notable only because of their absence. In fact , even the site supervisor is appointed only to keep tab and record of the labour contractors, subcontractors and raw material inventory on the site. Whilst quantum of work done is monitored, the quality of construction is monitored only in passing. The site supervisor should actually report to a engineer and should be equipped with quality control tools and manuals. Worse still, the supervisor is not allowed to operate the site in an engineering fashion. As per norms in government jobs we should have one supervisor per 50 workers on the site but you will see two or three supervisors even where there are almost 400 people working.

The task of the site-supervisor has become more of a commercial one of clearing and passing contractors bills with some technical errands thrown in! The site-supervisor reports to the project organizer who sees him as a fix-it man for the routine upsets that occur on site.

This is OK in the case of tenements and small buildings but when it comes to 20 storey buildings, the approach will have to make way for serious infusion of project management talent that will pave the way for better construction practices and superior quality structures.

As managed currently, we believe that amount spent on site administration including supervision do not add to any constructive quality, productivity or reconciliation; That if scientific site administration is organised at slightly extra cost it will positively impact the extendable durability of the structure..

GIFT is leading by example. The stated philosophy for construction of GIFT is "To design a CBD that will serve as a paradigm for Next Class city in terms of quality of life, infrastructure and ambience aiming to be high-density and high-rise, treating land as a precious resource...

What GIFT will definitely do is that it will add tremendously to Ahmedabad’s infrastructure and re-frame its outlook on built space.

think about it

As per the new GDR announced by AUDA
The Following space has to be left for parking in any construction

Useage	Current	Proposed
Residential	15% of FSI	20% of FSI
Commercial	30% of FSI	50% of FSI
Multiplex-Mall	1sq m / seat	60% of FSI
Education		20sq m to
	70 sq m per 100 students	40% of FSI
Affordable Housing	-	10% of FSI

Dedicated drop-in and drop-out space must for schools/collages

The Following Height Restrictions have been fixed as per the new GDR announced by AUDA

Road width	Building Height	Floors
Only on 60 m	70 m	23.3
18m - 40 m	45 m	15
12m - 8 m	25 m	8.3
9m - 12 m	15 m	5
Less than 9 m	10 m	3.3

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Clients : Fine Art Pvt. Ltd.
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MORYA BLUE MOON - Mumbai

Project Name : Morya Blue Moon
Clients : Beejay Realtors
Site location : Andheri, Mumbai
2 Basement + 15th Stories

HARITA IT PARK, Bangalore

Project Name : Harita IT Park
Clients : Harita Projects (P) Ltd.
Site location : Electronic City, Bangalore
2 Basement + 12 Stories (IT Park)

LOTUS PARK- Mumbai

Project Name : Lotus Park
Clients : Lotus Corporate Park
Site Location : Jogeshwari (W), Mumbai
4 Basement + 22th Stories (7 Wings)

CONWOOD ENCLAVE - Thane

Project Name : Conwood Enclave
Clients : Conwood Realty
Site location : Thane (W)
1 Basement +31th Stories

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Advertorial

THE CAPITAL

THE CAPITAL, built by the Sahjanand Group is an18 multistorey business hub having showrooms and offices coming-up on the arterial Science City Road.

Towering on a 6400 square yards plot and oozing with upmarket flair, THE CAPITAL boasts top rank amenities that are yet to be seen in Ahmedabad.

First things first. THE CAPITAL offers a bouquet of solutions that address head-on the multiple problems of parking, business amenities and a posh ambience .

Car Parking

As opposed to offices on Ashram Road and C. G. Road, THE CAPITAL will not have any issue with parking. For the first time in Ahmedabad a complex will have stacker and puzzle parking in a three storey basement that can hold up to 500 cars.

Lifts

THE CAPITAL has a total of 14 lifts that make for convent and swift vertical movement. Of these, 2 lifts are for the service providers like watermen, couriers, housekeeping and others so that the reamainder lifts are reserved for the owners.

BRTS Advantage

The complex is situated on the BRTS route which gives it the advantage of a world-class award winning public transport system that drops you at its door step. One will be to reach almost any important destination in less than 30 minutes – no traffic jams! No rush hour!

SAHJANAND GROUP

Amenities and Conveniences

There is a thoughtful provision of a well-appointed Conference Room where anyone having an office in the building can have meetings with his guests.

THE CAPITAL comes with scenic and soothing terrace gardens on the fourth and twelfth floors. This will help the over-worked office goers and businessmen in the building to relax.

A coffee shop and a restaurant in the building will do away with the need for rushing to far away places for snacks, tea and meals.

We live in the world of the internet and THE CAPITAL thoughtfully provides fiber-optic connectivity for all floors.

Ambience

THE CAPITAL comes with a 10,000 square feet Atrium of 50 feet height - the largest Atrium for any building in Ahmedabad .A grand way to welcome your guests. And then you have the generously broad 10 feet corridors to take you to the office door-step.

Offices

There are offices of all sizes beginning from 650 square feet onwards.

MEP SYSTEM DESIGN CONSIDERATIONS FOR SUPER HIGH-RISE BUILDINGS

Pankaj Dharkar

Mr. Pankaj R. Dharkar is a leading MEP Consultant from Ahmedabad with offices in Ahmedabad / Mumbai / Bangalore and other cities. During his rich experience of 33 Yrs in the field of MEP, he has to his credit, of designing & installation of more than 3000 Projects across India & outside India which also include several Tall Buildings like the Tallest Hotel and the Tallest Residential projects coming up at Mumbai.

He is Voting Member on TC.9.12 (ASHRAE) global committee which deals with developing technical standards for Tall Buildings. He happens to be the only Asian Representative on global team. Pankaj is past National President of ISHRAE / past President of ASHRAE WI Chapter and currently President of Fire & Security Association of India.

Introduction

After the announcement of General Development Regulation (GDR) for Ahmedabad, there is a wave of launch of new construction projects mainly tall buildings which shall adorn the skyline of the city in coming years. Architects, Consultants, Structural engineers, Civil engineers, MEP engineers, Contractors and all others related to construction industry are keenly waiting for the development of New Vertical Ahmedabad under their expertise. This note stresses upon the role and importance of good design and MEP services in tall buildings and makes the point that their implementation will be extremely important for efficient functioning of High rise Buildings.

Tall buildings around the world are created mainly as a symbol of vision, determination, innovation and achievement. During the first 90 years of this century, USA dominated the race for the title of the tallest building in the world, and constructed a range of famous buildings. But since the 90's USA has got some stiff competition from Asian countries. Today, several countries are in the competition for constructing the tallest buildings.

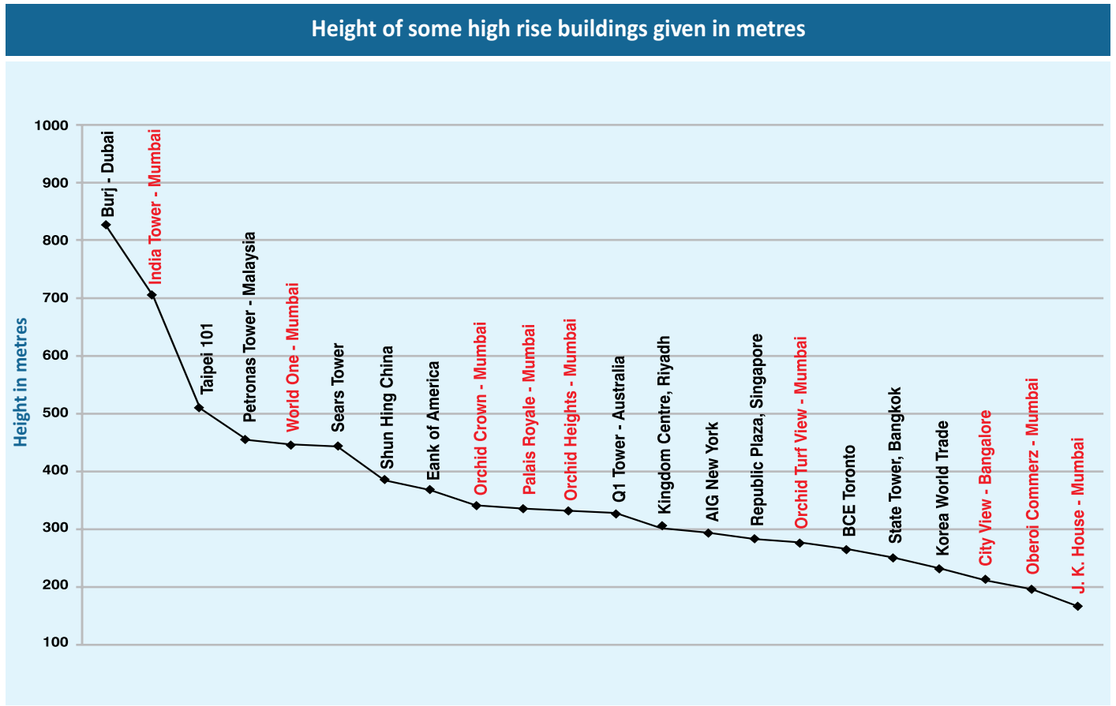
According to the Emporis Standards Committee, today the world's Top Ten high-rises are scattered across the globe in Taipei, Shanghai, Kuala Lumpur, Chicago, Hong Kong, Guangzhou, Shenzhen, Canada and New York. On January 4, 2010, Dubai unveiled the world's tallest building– the 'Burj Khalifa' having a height of 828 meters. It has been declared recently that Kuwait is building the world's tallest tower at 1,001 meters in Madin at Al Hareer.

Closer home, in a city like Mumbai, where availability and access benefit be derived from the limited space, high-rise buildings hold the potential for larger real estate development, while being financially viable. This is the reason most of the super high rise buildings are being developed in Mumbai.

Population growth in Ahmedabad and the increasing pressure on land over the last decade, have compelled Ahmedabad to realised that they cannot afford to lag behind any more, but build tall. The last five years have shown growth and progress in this direction and several projects are now in the pipeline.

Super High Rise Buildings

ASHRAE Technical Committee for Tall Buildings TC 9.12 has defined "A tall building as one whose height is greater than (91m). The recognition of the tallest building in the world, is the responsibility of the Council on Tall Buildings and Urban Habitat(CTBUH) today, which has been set up to report and study all the aspects of construction of tall buildings. The Council on Tall Buildings and Urban Habitat (CTBUH) defines a tall building as one in which the "tallness" strongly influences planning design or use. By certain other standards and estimations, buildings are classified as high-rises when their heights are in the range 35-150 meters, while anything above 150 meters might be classified as a skyscraper or super high - rise building.



MEP System Design for Super High Rise Buildings

Skyscraper construction and design has to deal with complex challenges of balancing construction management, engineering services and financial considerations. Design of building services is a complicated issue especially in case of the super-tall structures. It has become necessary today for new high-rise buildings to be designed in such a way as to reduce energy consumption and increase efficiency.

In a super high-rise building, all the structural, mechanical, electrical and plumbing systems need to be well designed and integrated to incorporate innovative technologies for energy efficiency. Building automation integrated computer controls should also be effectively used in monitoring of HVAC, lighting, security, fire fighting and vertical transportation in a super high-rise building.

It is a very important fact that the success of any tall building lies in the collaborative effort, of owners, architects, structural engineers, mechanical and electrical engineers and other specialized engineers and consultants.

The strategic objectives of good HVAC system design and its management is to provide a comfortable environment and to limit the spread of fire and to control the movement of smoke within the building during an emergency. HVAC system design for very tall buildings is a specialized application and hence ASHRAE has provided "HVAC Design Guide for Tall Commercial Buildings" for general reference. However, while designing tall buildings in India, importance to the local regulations and city codes needs to be given besides following other standard guidelines. The main standards to be followed are International Building Code (IBC), International Code Council (ICC), and National Fire Protection Association(NFPA) and many others. There are 32 standards for fire fighting and another 132 standards in place for fire fighting equipment as mentioned by the Bureau of Indian Standards.

Challenges in MEP System Design

The biggest challenge faced while designing of MEP systems for very tall buildings is integration of MEP services with other mechanical, plumbing and

electrical services and also working in coordination with Architects, Structural consultants, Façade / Glazing consultants, Lighting consultants, Landscape consultants, Kitchen & Laundry consultants, Aviation consultants, Acoustic consultants, LEED and Sustainability consultants etc.

The factors playing an important role while designing of MEP systems are :

• Proper selection of air conditioning system

• Location and size of equipment room

• Optimum utilization of service space: mechanical service floor and shafts.

• Ease of maintenance and its provision

• Stack effect and ventilation / air conditioning of atrium

• Smoke extraction system at each level and from atrium area

• Seismic considerations

• Wind pressure considerations

• Noise transmission and acoustical considerations

• Design and location of cooling towers Ventilation & Smoke Management System

Atrium

An atrium is an integral part of any tall building and usually acts as a focal point for communicating with all other areas. Some very tall buildings may have more than one atrium usually starting at different levels. Atria typically involve large open spaces connecting multiple floors and in some instances, the spaces can be large enough that individual zones of greatly varying temperatures may exist within the atria. Design concept of spot, cooling only the occupied areas, can be done but high diffuser throw velocity must be maintained to counteract any thermal induced air currents. Usually an atrium has to be viewed as a three dimensional volume from the start of the project for which CFD analysis becomes necessary.

The smoke control system requirements for an atrium will usually dictate the design of the HVAC system instead of only cooling or heating requirement of that space. The smoke management system design has to be developed before the designing of the thermal comfort system is done. Again, it is important that these have to be incorporated into the architectural design at the building planning stage for successful implementation.

Design of atriums of very tall buildings is critical in terms of smoke extraction which requires special engineering solutions such as:

• Providing effective smoke extraction system to control the smoke movement in the atrium area and its removal with the help of exhaust fans at a higher level of atrium.

• Providing smoke curtains which will isolate the atrium from the floor where smoke is generated.

• Providing water mist nozzles and side wall sprinklers in the atrium area

Smoke Management System for Super High-Rise Buildings

The central air conditioning system in the case of high-rise buildings needs to be well equipped with fire and smoke dampers, smoke detectors and arranged to shut down the system and operate the fire and smoke dampers to close during an emergency. In addition to this, the fresh air branch should have fire and smoke dampers set to close, in case of fire. The system should be so designed that the combustion products can be easily removed from the building without spreading to the adjacent areas.

A fire fighting system also plays an important role in the design of a tall structure. The prime considerations for fire safety include different aspects such as the standard means of fire escapes, provision of smoke control devices, facilities to assist fire services, use of fire resisting materials, separation of floors, fire escapes, fire fighting shafts and vertical transportation. See Table 1.

Table 1: Smoke movement and its extraction

No	Fire location	Smoke Movement	Smoke Extraction
1	Atrium	Upwards, hitting the atrium top in case of large fire or spillage in case of low intensity fire	• Smoke extract fans at roof level to operate or to have an openable roof system • Atrium side throw nozzles to operate • Smoke curtain at refuge open area to shut off • Local smoke extract
2	Corridor	Upwards, hitting the ceiling & spilling over to corridors above & atrium area	• Local smoke extract fans on refuge levels to operate • Misting sprinklers at edge of corridor to start • Smoke curtain at refuge open area to shut off
3	Floor levels	Spillage to floor levels	• All doors at the apartment entry to be fire rated • Floor to floor barriers to check upward travl and entrance to floor above
4	Electrical shaft in escape core	Vertically upwards in the shaft	• Smoke extraction system within the electrical shaft to operate • Pre action / gas suppression system in the shaft to start • Shaft door to be fire rated

Seismic & Wind Load Consideration in the Design

Lateral forces due to wind or seismic loading must be considered for tall buildings along with gravity forces while designing. Very often the design of tall buildings is governed by lateral load resistance requirement in conjunction with gravity load. High wind pressures on the sides of tall buildings produce base shear and overturning moments. These forces cause horizontal deflection in a multi-storey building.

Pipe joints and supports for chilled water piping and fire hydrant and sprinkler riser selection require specific attention. Pipe joints and supports need to have enough flexibility and strength to withstand seismic motion and swing effect due to wind load. It is necessary to get CFD simulation done for understanding the effects of vertical forces before selection of supports and flexible joints.

The horizontal seismic motion of the ground causes the most significant effect on the structure by shaking the foundation back and forth. If the equipments at plant levels at higher altitude are not provided with special installation features, they will act as projectiles in case of an earthquake. The installation of all equipment should be such that in case of an earthquake and swing effect due to wind the equipment should not get displaced from its location. For this the equipment needs to be fixed and held in its position in such a way that the degree of movement in all the directions should become nil.

The designing, selection and installation of MEP systems in super high-rises is a specialized job that involves several structural, safety and design challenges wherein lateral loads, increased wind pressures and gravity loads are also major factors influencing final decision.

Conclusion :

Ahmedabad is steadily witnessing a boom in high-rise sector because of the new GDR where in Auda has allowed the high-density zones with more FSI. In future, the new 'Tall Ahmedabad' is likely to give a stiff competition to the other big cities of India. The upcoming new era shall hopefully change the overall approach of Builders and Developers towards the much neglected MEP services, its design and implementation for successful development of these Tall Buildings. The Consultants shall probably get the much needed respect and importance for their technical expertise. The professionals related to construction industry mainly related to design of MEP services have a great future ahead wherein there is ample scope for their own growth along with the growth of the city.

think about it

The Empire State Building was built quickly and under budget. It took only one year and 45 days to build, or 7 million man-hours. To this day, this is a record for a skyscraper of its height.

Though rumors of hundreds of people dying on the work site circulated during the time of its construction, official records state that only five workers were killed: one worker was struck by a truck; a second fell down an elevator shaft; a third was hit by a hoist; a fourth was in a blast area; and a fifth fell off a scaffold.

The building's opening coincided with the Great Depression in the United States, and as a result much of its office space was initially unrented.

The lack of renters led New Yorkers to deride the building as the "Empty State Building". The building would not become profitable until 1950.

Empire State Building held the title of the tallest building in the world for 42 years since 1931 till it was finally surpassed by the North Tower of the World Trade Center in 1972.

Mehernosh Faramrose Dastoor

THE SPREAD OF FIRE IN HIGH-RISE BUILDINGS

Mehernosh Faramrose Dastoor

Mr. M. F. Dastoor was appointed as Station Officer in 1984. In 2001 he was promoted as Divisional Officer and in 2004 he was further promoted as Dy. Chief Fire Officer and in 2006 promoted as Addl. CFO and in 2009 he was Promoted as Chief Fire Officer.

His father worked as Chief Fire Officer in Ahmedabad during 1976 to 1990.

Introduction

Problems in high rise buildings is that once it goes above five floors - that is above 50/60 feet - wind velocity, even in normal circumstances, is very high. In close clusters where wind velocity could be lower, the problem takes the form of the funneling effect of the wind. In either case, when the fire starts, it spreads very very fast through the building; horizontally when there are high winds and vertically with or without winds. Conduction currents are there; convection happens; transfer of heat through the building materials happens.

Therefore, in the case of high-rise buildings, it is a three dimensional scenario and the fire spreads threefold, especially in the case of high-rise buildings and that is why we have to be very careful whilst designing the building and the fire-protection system itself.

A building can be of any height but it has to be protected internally. Ahmedabad Fire and Emergency Services with it ladders has to reach height of 55 meters. There are higher ladders available in the market, in fact the highest ladder available in the world is 112 meters but it would be very difficult to deploy it, in cases of emergency. Then there are buildings of 400 meters height and 500 and even 600 meters too! At these heights nothing will help externally; you have to have an in-built fire protection system with all the fire-loads calculated. This will cut the spread of fire and curtail it to the limit it was noticed.

The new GDR

(I discuss below the new GDR provisions in a general, broad and summary way to draw attention of the readers to some of the salient features. Do consult the relevant provisions at the time of designing and building your structure.)

The new GDR mandates broader corridors if they are longer. (see box 1) These unit width parameters (that apply to ladders as well) are calculated depending upon whether 1, 2, 3 or 4 people are getting off the corridor per second. Taller buildings must have width of staircases of 2 meters; buildings up to 10 floors must have width of staircases of 1.5 meters.

A staircase is a means of unaided escape for people in the case of a fire, even before firefighting services come to the site. Irrespective of whether it is a residential or commercial building, there must be a staircase within 25 meters of travelling distance.

Once a general fire alarm is raised either by manual fire-alarm call points or automatically by fire-detection systems, evacuation starts. However, people should not need to run through the staircase; they should be able to move fast from their individual floors to the staircase.

The new GDR mandates that staircases and lift shafts of taller buildings do not go to the basement but end at the ground floor. Independent staircase separated by a wall will reach the basement. However, even in such cases, the basement design must ensure that the smoke and hot gasses occurring in plants or cars do not travel to the higher floors. All in all, the design should be such that it contains the hot gasses and smoke hermetically for four hours. Further, even the doors ought to have four hours resistance, especially of the basements.

When you go to the higher floors, both the staircase and the lift shafts are to be in separate sections and have protection of two hours fire resistance doors.

In the factories having heights, it is the materials used that govern the fire-fighting issues.

The staircase, at least at one end must be open above the parapet wall so that there is no smoke logging. In case of hotels with closed corridors we insist on automatic exhaust fans that open their louvers and switch on automatically the moment the smoke detectors installed indicate a fire. This is in addition to the air-conditioning system that reverses its operations and sucks air out of the building.

All these provisions add up to isolate the staircase, even though it is within the building and allows (in the event of a fire) people travelling from higher floors to travel down safely, after the door gets closed, even surpassing the floor on which there is a fire raging, without encountering excessive heat, smoke and hot gas.

Basements ought to have adequate ventilation that allows 6 to 8 air changes per hour in normal circumstances and 10 to 12 air changes per hour in case of emergencies.

In very big basements that accommodate 200 to 400 cars we advise a curb wall of one meter height from the floor so that in the eventuality of a car catching fire, the heat is not transferred to the row of cars parked opposite to it.

An estimated allowance of 5 x 2 meters is allotted per car and so there must be a minimum of one sprinkler for every 10 square meters of the basement parking lot; in two layered parking lots in basements, a minimum of 2 sprinklers per layer per 10 square meters of area are mandated.

Chief Fire Officer M. F. Dastoor in action

Inducing a sprinkler may not extinguish a car fire, but it will keep the fire and the temperature under control. The sprinkler does two things. It sets of an alarm whilst preventing the fire from spreading. Secondly, it will protect the structure of the building as concrete structures weaken at temperatures of 600 degrees Celsius and any car on fire develops temperatures in excess of 800 degrees Celsius.

People think that fires only happen to others

People think that fires only happen to others, yet, about 1680 fires happened last year in Ahmedabad. Of these, about 10 or 12 people succumbed to the burns and these were the suicide cases. In suicide cases, things become difficult - almost impossible, because fuel has been poured all over the body and the person has almost burnt by the time we arrive.

During a fire, the major cause of fatalities is panic that is caused because of intense smoke due to which one cannot see, even if one had a torch. It may be daytime, yet you would not be able to see more than a foot away. In the panic that ensues, people rush here and there . Almost 80% of fire related fatalities are due to smoke. Direct burns, in cases other than suicides, are not more than 2% to 3%.

Ahmedabad Fire Fighting Capability

As on today, we have 6 lac litres water on wheels at all times. It is scattered on fire engines over 13 fire stations (shortly to be increased to 15) of Ahmedabad and these fire engines can converge to the fire spot anywhere in Ahmedabad in 20 minutes. Officially, on paper, we are not allowed to use the BRTS corridor but in the case of an emergency when the mixed-traffic road is choked with traffic jams, I don't think the fire engine would be stopped if it were to use the BRTS corridor to rush to the fire spot.

We have an operational cadre of 600 to 650 men on 24 hour call – there is no shift system. Excepting for about 10% of the staff who may be on leave, the rest are all on call throughout the day. That is the reason we can make do with a less number of personnel. In Surat - due to shift system - of the 800 firemen only 200 will be present at any given time.

We have 12 mini-fire tenders with mis technology working at 100 bar pressure and using only about 60 litres of water per minute. Each of these units, carries 2000 liters of water. We also have 17 regular B water tenders that carry 5000 liters of water with capability of pumping 6000 liters per minute capability but at 15 bar pressure(150 meters head). If you get water from an open source, you can pump higher volumes.

We have 40 water bowsers, each of 10000 liters capability; to this we will be adding 7 more units of 20,000 liters capability. All our fire stations have underwater tanks with pumps to fill up these vehicles in 6 minutes. Over and above this, we have identified 40 places where our bowsers and fire tenders can go to and get water replenished in 4 to 5 minutes (replenishing time)

We have a turn table ladder of 55 meters and a hydraulic platform of similar meters, both of these can be used for rescue and firefighting operations for tall structures. There is other equipment as well like rescue vehicles, foam nurses, foam tenders etc.

Our people can reach the fire site in 6 minutes flat, provided we do not encounter traffic jams.

We are better off now

Earlier we used to see slipshod planning and poor construction quality but happily, things have improved vastly. Moreover, there is a change in the buyers too; they are now willing to pay higher prices for quality housing. And it is this that discourages builders from delivering a bad/faulty product that does not fully comply with construction norms. Moreover, the stern implementation of bye laws – especially in case of fire – has ensured that buildings today are safer than they were earlier.

I will say that the construction industry is doing its bit and has upgraded and up scaled the fire detection and prevention of the structures they build. Their buildings have proper escape routes, they have enhanced modern fire fighting systems and therefore are not a threat to society from the fire angle.

TTL (Turn Table Ladder) Ahmedabad Fire Fighting Services

I must put in a caveat here. Even though a new building has all fire prevention/protection equipment in place, what happens subsequently is that the occupants take the maintenance of these systems very lightly.

In fact, many of them do nothing and let the systems fall due to negligence and disrepair with the result that the systems put in place by the builder are not functional at the time of a fire. Therefore, the maintenance of fire safety systems has to be enforced; sometimes with measures the occupants of the building do not like and complaint against.

Of the around 1500 towers in and around Ahmedabad I can say that around 600 have operative fire systems that are certified. Another 300 or so may be having operative fire systems but haven't cared to get it renewed. The rest have fire systems installed but the systems are in an inoperative state.

Conclusion

I would advise that all buildings coming up, especially high-rise buildings must be equipped with their own individual fire protection systems and that these systems must be maintained and remain functional at all times. Please remember that, if, once a thing is burnt it does not come back. A life lost will not come back. Build safe! Build Strong! Build High! ▪

AHMEDABAD, THE CHALLENGES AHEAD

GICEA Vice President Nitesh J Shah

The notion that Ahmedabad is not ready for tall buildings has fostered because the old bye-laws permitted buildings up to 40 meters but the newly amended byelaws have extended the permitted heights up to 70 meters. It is not as if the rules permitting high rise buildings were extant and the buildings were not coming up due to want of demand or know-how or dearth of entrepreneurs.

Truth is that Ahmedabad has always embraced change and - now that the rules permit - the whole nation will get to watch the show as Ahmedabad blossoms into a city of towering and handsome buildings. This is how it should be, for after all Gujarat is India's fastest developing state and Ahmedabad its proud capital.

Of course whilst designing these tall buildings the structural concerns will be foremost. We will have to bear in mind that earthquake is a major issue of concern as Ahmedabad is highly vulnerable to earthquakes not only as it falls under moderate to high risk seismic zone III but its proximity to seismic zones IV and V regions. Another region of study will be the soil strata of Ahmedabad. Most of the soils here are sandy silt with a little amount of gravel and are non-plastic in nature. Chemical analysis of sulphates, chlorides and organic matter are to be analyzed in the soil. The fact being that we have to analyze the safe load carrying capacity of the pillars. The true challenge will be for the structural consultants in Ahmedabad to rise to the occasion.

The design scenarios will get sophisticated and architects will have to engage services of external consultants - as a rule and not as an exception. Project management

consultants will also have to be involved. So far the developers were appointing in-house managers and site engineers but now this practice will have to give way to professional project management agencies who will coordinate everything from day one, or even before that.

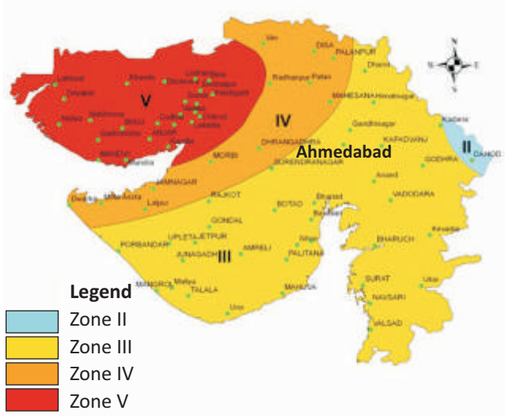
Another change will be the stringent application of fire fighting regulations. All building owners of buildings over 45 meters will have to appoint a full-time fire-man onsite

The construction scenario will see infusion of talent from Mumbai and other Metros as the available stock of contractors - with some notable worthy exceptions - neither have the tooling nor the expertise to manage construction of such scale.

Different technologies will have to be employed. To give an example, in a 10 storey tower, we have isolated footing but for the 22 storey buildings we will have to go for one meter raft. For commercial buildings having 22 storeys, the new bye laws stipulate 2 to 2 and half basements and this adds the dimension of safety and earth retaining treatment during the excavation process, something - sadly - not necessarily a concern for buildings of lesser floors in Ahmedabad right now.

As an architect designing a tall building is thrilling! It opens up new vistas for the exteriors, atriums, podiums for parking and the vertical transportation of men and materials. Yet, it needs a thorough familiarity with the bye-laws pertaining to plumbing, electrical works, fire-safety and hazards related to high speed winds and safety during construction of the building, the workers and the structures around the periphery of the site.

More than the design of the building - which was earlier thought to be the only preserve of the architect - the architect of tall buildings will have to be somewhat circumspect and take with him all the various consultants - MEP. Fire, HVAC, Structural and others - and give them sufficient leeway to perform, even if it is at the cost of his



Seismic Zones of Gujarat

pet design ideas.

The technical problems of construction, which gave the engineer more or less anxiety a few years ago in connection with very high buildings, seem to have been solved. There is no more difficulty in going up twenty stories than twelve. The development of the structural steel industry and the application, to architecture of the principles of bridge construction, seem to have made buildings of this class enduring, stable, and safe. The development of the elevator has rendered the upper stories more conveniently accessible and desireable for occupancy because of having better light, air and sumptuous views of the city. From the angle of fire hazards, provided the building has its own fire protection and detection systems, the tall building is as safe as the smaller ones.

What remains is the human factor. Construction of tall buildings is a relatively new henomenon in Ahmedabad. There will be urgent need for the skill up gradation of the semi-skilled and skilled workers of Ahmedabad and I see this as an opportunity for institutes like our GICEA to start such training modules by inviting experts from other Metros to demonstrate at-site new methods and technologies that Ahmedabd construction workforce will need to learn.

What does all this mean? Firstly, the construction cost will shoot up. As opposed to construction costs of - say - Rs. 800 to Rs. 1200 per square foot fora regular 4 storey

building the 22 storey buildings, will have a minimum construction cost of - say - Rs. 1800 to Rs. 2200 per square foot. Moreover, this does not include costs of two storeys that shall have to be left vacant for services and fire protection. It does not include the approximate Rs. 200/- per square foot provision for safety of workers during the construction process. Will the buyer take the higher price? Provided that he gets what he wants, I am confident that he will and this brings us to the final challenge - the marketing of these buildings! The marketing , too, will have to be hi-fi and targeted at sophisticated and savy corporate houses and the well-heeled elite.

Mr. N.K. Patel

STATISTICS FOR SKYSCRAPERS

Courtsey

RESMA

No	Parameters	Option 1	Option 2	Option 3	Option 4
1	Avaliable F.S.I	2.7	2.7	2.7	4
2	Building Height	P + 7 Storey	P + 14 Storey	P + 20 Storey	P + 20 Storey
3	Ground Coverage	40%	20%	15%	20%
4	Assumed Land Price in Sq-mts	90000	90000	90000	120,000
5	Assumed Jantri Rate in Sq-mts	25000	25000	25000	25000
6	Saleable FSI	4	4	4	6.2
7	Land Factor to FSI	22500	22500	22500	19355
8	Payment FSI Factor (2.7-1.8)	2250	2250	2250	3550
9	Construction Factor	9000	12000	18000	18000
10	Other Factors (Adminstrative, Legal, Marketing, etc)	1000	1000	1000	1000
11	**Total Cost in Sq-mts**	**34750**	**37750**	**43750**	**41905**
12	Avg Selling Price in Sq-mts	51150	53800	59000	59000
13	**Feasability in Selling Price Per Sq-mts**	**16400**	**16050**	**15250**	**17095**
14	Duration of Project	18	24	30	30

Assumptions

Saleable FSI - For building with Super Built-up of 38% Saleable FSI of 4.0 is assumed

Average Selling Price-Basic Rate of 50,000 Sq-mts for floors 1, 2, 3 & Rising Premium 800 Sq-mt (i.e. 75/Sqft) for higher floors

Payment FSI Factor-40% of Jantri Rate payable as Premium for FSI above 1.8 in R-1 Zone

The Construction Cost & Selling Price for 3BHK & above Premium apartment is considered

Conclusions

From option 1, 2 & 3, fabove figures suggest, that option 1 is more feasible.
Option 4 is recommended in TOD Zone.
In TOD Zone with FSI 4, option 2 is highly recommended.

Some Structural guide lines for 13 to 15 storey buildings

by Vatsal S. Patel Managing Committee Member of GICEA 2013-2014

Height to width ratio of building for tall buildings	5 to 7
Soil Investigation	For a 2 basement building, 20 meters deep bore should be dug out. If water table is encountered and N-value is less than 15meters with grain size distribution curve sharp 'S' type, there are chances of liquefaction during earthquake so detail soil investigation should be carried out and consult Geo - tech Consultant for foundation design. Sometime cast-in-situ pile foundation with Raft is recommended.
Governing loads	Wind load and earthquake load along with vertical loads.
Structural System	RCC frame with shear wall (Interior structure), lift well walls should be design as shear walls.
Material	Use RCC of M35 to M50 Mix concrete with Fe500 steel reinforcement is cost effective. Composite structure i.e. steel frame and RCC slab is not economical for 15 to 30 storey building.
Welding of Reinforcement	Welding for lapping of reinforcement can be recommended but location of lap length should be clearly shown in drawings i.e. where min. stresses occurs (location of point of contraflexure). Design of length of welding might be less than 200 mm for required lap length, but min 200 mm welding length is advisable.
Approx. material consumption	•Concrete of 0.25 m3 to 0.30m3 per sq. mt. of built up area. •60 to 80 kg per sq. mt. of steel reinforcement of Fe500

The above-mentioned points are presented as guidelines. It should be borne in mind that they are also depending upon other design and service criteria related to building shape, aspect ratio, use of building, load conditions, site constraints and building sustainability.

IT IS NO MORE BUSINESS AS USUAL

Mr. Munir Shah (B. Tech Civil (CEPT), having 20 years of rich experience in management and execution of civil construction. He has utilized his expertise & innovative technologies to achieve excellent quality of works in every project within agreed time schedule. His integrity, knowledge and business ethics has taken his Company to the remarkable position in construction industry.

They say that if you want different results you have to act differently. When - because it is no more a matter of if, but when - Ahmedabad begins building tall in full swing, it will no more be business as usual. It is now the era of technically qualified professional contractors with sound finances and infrastructure and also who are constantly upgrading the skill sets of their workers through routine on-site training and drills.

Having said that, the biggest challenge in constructing tall buildings is ensuring safety during the construction. Right now we are not acquainted with such practices here because currently we build up to a maximum of 10 to 12 storey buildings in Ahmedabad.

Falls are the leading cause of worker fatalities. More than the actual danger of falling, what would really precipitate a fall, is the fear of falling. Fear prevents the efficiency of everyone working at heights. To remove these fears, there have to be arrangements that establish in the worker's mind that in the event of his falling down, nothing will happen to him. That he is safe, even if he falls! To ensure this, we have to have fall protection systems appropriate for given situations and train workers in the proper selection, use, and maintenance of all protection systems

One such system that we are using is the horizontal personnel netting along the periphery of the building which keeps shifting up as the work progresses upwards. This netting extends outward horizontally a minimum of 10 to 15 ft from the building to protect workers from falling.

Also, Vertical drop netting is erected along the perimeter of open floors at construction sites to prevent material/debris from falling from the site.

Danger is lurking everywhere. Apart from the immediate fear of falling off from a height, the other ever present danger is mainly from electrical works in the form of loose wires and cables.

Another challenge is to lift the construction materials to the higher floors. Tall buildings require sophisticated methods of getting people up and down. We have our own tower crane that we are using at our Westgate site near YMCA. In the 10 to 12 storey structures, the labor force has to fend for itself when they need to climb up to the higher floors. This cannot be expected for buildings rising up to 20 storey or more. An arrangement has to be in place for carrying the workers and the engineers to the higher floors.

They say that if you want different results you have to act differently. When - because it is no more a matter of if, but when - Ahmedabad begins building tall in full swing, it will no more be business as usual. It is now the era of technically qualified professional contractors with sound finances and infrastructure and also who are constantly upgrading the skill sets of their workers through routine on-site training and drills.

We have onsite laboratory and all tests are done on site itself. All raw materials including the incoming concrete are inspected for their quality prior to their use.

These practices are alien to most of the construction work being carried out in Ahmedabad; however, currently, we are in the middle of a quick transit period. Things are changing for the better and there is a shift to better and advanced practices.

Leading the charge, is a new set of young second generation contractor-entrepreneurs who insist on not leaving a single stone unturned to ensure the best output and to achieve this are, eager to tap all the available technology, irrespective of the capital costs involved. This is the only way forward, if Ahmedabad is to build tall. There will be escalation in construction costing. Costs will increase concomitant with increase in height. ▪

Mr. Tejas Dalal (M.S., Civil, USA), is having 18 years of experience in management and execution of civil construction, including 5 years of experience in USA. Armed with an international exposure of best practices and latest know-how, his dream has been to transform the perception of construction businesses in India by making Hi-Tech the symbol of professional integrity.

Work in progress at Westgate near. YMCA, Ahmedabad.

"Another challenge is to lift the construction materials to the higher floors. Tall buildings require sophisticated methods of getting people up and down. We have our own tower crane that we are using at our Westgate site near YMCA."

THE AHMEDABADI BUYER OF REAL ESTATE HAS MATURED.

Mr. Manoj Gamara & Mr. Atul Patel of Sahjanand Group

Ahmedabad is going vertical and it is a good thing too. The trend for going vertical is the only way out if we want to reign in mounting real estate prices and shrinking land resources. The vertical skylines of cities make them look impressive and are a matter of pride for the citizens. Ahmedabad may be a late entrant in the Tall Club, but we are not wasting time any more.

Of course, we have to thank the government for two thingswithout which the changes that we will see in the Ahmedabad skyline may never have been possible.-

• The conception and wholehearted execution of the GIFT city project. This will be a trailblazer and set a fitting example for other states to follow. It will also usher in a culture of high-rise commercial and mixed-use buildings in Ahmedabad.

•The farsighted policy of AUDA in permitting higher FSI, especially along the BRTS and Metro Rail corridors. This is going to be a real fillip for the construction business of Ahmedabad and will help in reducing the shortage of commercial built space in Ahmedabad.

In Ahmedabad, there is an impression that the rich and elite live only in personal bungalows. Whilst this is true, it is also true that there is a shift in preferences as well. If you will go to Prahladnagar road, you will see majestic high-rise residential buildings, all of which are occupied by the elite of Ahmedabad city.

The current physical landscape of Ahmedabad, has happened not just out of free choice or market forces, but on account of our town planning rules that allowed buildings of low height. The rules favoured single-family larger and larger homes in far flung suburbs. However, we think a that lot of young people, especially those that are coming from outside the traditional Ahmedabad city are beginning to realize the advantages of staying in close knit, dense urban cities.

The Capital, The latest project of Mr. Manoj Gamara & Mr. Atul Patel of Sahjanand Group

In Ahmedabad , there is an impression that the rich and elite live only in personal bungalows. Whilst this is true, it is also true that there is a shift in preferences as well. If you will go to Prahladnagar road, you will see majestic high-rise residential buildings, all of which are occupied by the elite of Ahmedabad city.

In addition, the idea that the Ahmedabadi buyer is a habituated penny-pincher who is driving bargains and hunting bottomed out properties is only partly correct. The Ahmedabadi buyer of Real Estate has matured. There is a definite segment - and this segment is growing daily - that believes in good quality construction and is happy to pay higher prices. He / She weighs and measures the amenities to be provided, the construction specifications, the location, the ambience of the building, so on and so forth.

For our project "The Capital" we made study trips to Mumbai as well as Singapore, Dubai, Brisbane and New York and learnt that high-rise buildings are all about elevation, parking, atriums and top notch construction standards. These are the things we have incorporated into our project.

No doubt, Ahmedabad Realty market is sluggish now, but there is always a market for quality products. When the market was bullish, Ahmedabad was flooded with big-bucks projects. We had offices of 3000 and 5000 square feet, whereas currently there is a market for 800 to 1200 square feet offices. This is the segment we have largely targeted and your readers will be happy to learn that we have met with good demand. It is not as if we do not have 5000 – 6000 feet offices. We have them as well and have sold them too. We have offices of all sizes, but most of them are in the 1000 to 1200 square feet range. ▪

Rank	Name	Height	Floors
1	GIFT Diamond Tower	410 metres (1,345 ft)	86
2	Gateway Towers-1	362 metres (1,188 ft)	70
3	Gateway Towers	2 362 metres (1,188 ft)	70
4.	Crystel Tower-1	276 metres (906 ft)	65
5.	Crystel Tower-2	276 metres (906 ft)	65
6.	Clippers Tower-1	260 metres (853 ft)	65
7.	Clippers Tower-2	240 metres (787 ft)	60
8.	Clippers Tower-3	240 metres (787 ft)	60
9.	Crystel Tower-3	234 metres (768 ft)	55
10	Crystel Tower-4	234 metres (768 ft)	55
11	Naga Tower-1	230 metres (755 ft)	54
12.	Naga Tower-2	230 metres (755 ft)	54
13.	Garba Tower	210 metres (689 ft)	55
14.	Zydus Cadila Hospital	70 metres (230 ft)	22
15.	Mondeal Heights-1	70 metres (230 ft)	18
16.	Mondeal Heights-2	70 metres (230 ft)	18
17.	Pinecrest 1 (GGC)	70 metres (230 ft)	22
18.	Pinecrest 2 (GGC)	70 metres (230 ft)	22
19.	Pinecrest 3 (GGC)	70 metres (230 ft)	22
20.	Godrej Iconic 1	70 metres (230 ft)	22
21.	Godrej Iconic 2	70 metres (230 ft)	22
22.	Godrej Iconic 3	70 metres (230 ft)	22
23.	West Gate	70 metres (230 ft)	23

This lists ranks upcoming buildings in Ahmedabad Metropolitan Area (including Gandhinagar) that are under construction. All the buildings listed below will rise at least up to a height of 70 metres (230 ft).

From Wikipedia., Last modified on 2 January 2014

Health Check Up Camp

FELICITATIONS

Vice Chancellor of Gujarat University
Mr. M. N. Patel

"Change is the eternal process & I have cultivated it in my attitude to get the best of my ability"

-Mr. M.N.. Patel

GICEA felicitates Mr. M. N Patel on being appointed the new Vice Chancellor of Gujarat University - the largest university in the state. Mr. Patel had been heading LD College of Engineering, the state's oldest engineering college, for the past 10 years before taking up this assignment.

Mr. M. N. Patel, a civil engineer by profession, has several papers and two books to his name, too. At GICEA he is amongst our more active members and was part of the recent technical tour to Singapore and Indonesia.

We at GICEA take pride in the achievement of our member and offer our sincere and heart-felt best wishes.

Gujarat University

Quote Unquote

"The illiterate of the 21st century will not be those who cannot read and write, but those who cannot unlearn and relearn."

-Alvin Toffler

The GICEA News" being relaunched as GICEA Nirman

Winter Candle Light Dinner With Musical ProgGold Medal Award

Quote Unquote

"A leader is a dealer in hope."

-Napoleon Bonaparte

Gold Medal Award - 2013

Gold Medal Award - 2013

Quote Unquote

"Too much reading hinders knowledge. We think we know what we have read, consider ourselves excused from learning it"
-Rousseau

Seminar on Perspective View on Valuation Jointly Organized with Institution Of Valuers.

Technical Tour to Reliance Industries Ltd., Jamnagar.

Quote Unquote

"Education is the ability to listen to almost anything without losing your temper or your self- confidence"
-Robert Frost

WALK THE TALK
ON THE 7 SKY BRIDGES

INTRODUCING
HANGING OFFICE AND
GARDEN

UNVEILING THE NEWEST
CORPORATE LOCATION

HANGING GARDEN

WELCOME TO THE GRAND
50 FEET HIGH ATRIUM
CONNECTED TO THE CAFÉ ZONE

ITS TIME YOU EARN THE POWER

Sahjanand Group has been into real estate construction business for the past 21 years. In these years the company has sketched an exceptional image for itself. Architectural brilliance and impeccable quality has made them one of the leading companies in Gujarat. Having achieved so much, they still yearned to offer Ahmedabad something astounding.

After many coffees, discussions and hot arguments; the group came up with a never before Commercial property concept. Thus, The Capital was born. A place strategically located and meticulously designed to meet all your requirements. A work space you always envisaged. An office that is unique in planning and is the first of its kind in the city.

HIGH-END FEATURES

In order to offer you an absolute experience we have incorporated asmany amenities and features as possible. Safety and precaution has been given utmost importance to give you a carefree environment.

AC Ducting | High Surveillance Camera | Fire Safety Earthquake Resistance | Elevator

THE BIG ADVANTAGE

Fiber Optical Network | Conference Room | Anti-Skid Staircase System | Separate Café and Refreshment Zones | Ample Parking space | Water Recycling Plant Smoking zone | Water Supply | Water Proofing | 3-Phase Power Supply |

SAHJANAND
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Project by

SAHJANAND
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THE CAPITAL

OWN THE POWER

RISE WITH THE TALLEST BUSINESS HUB OF AHMEDABAD