



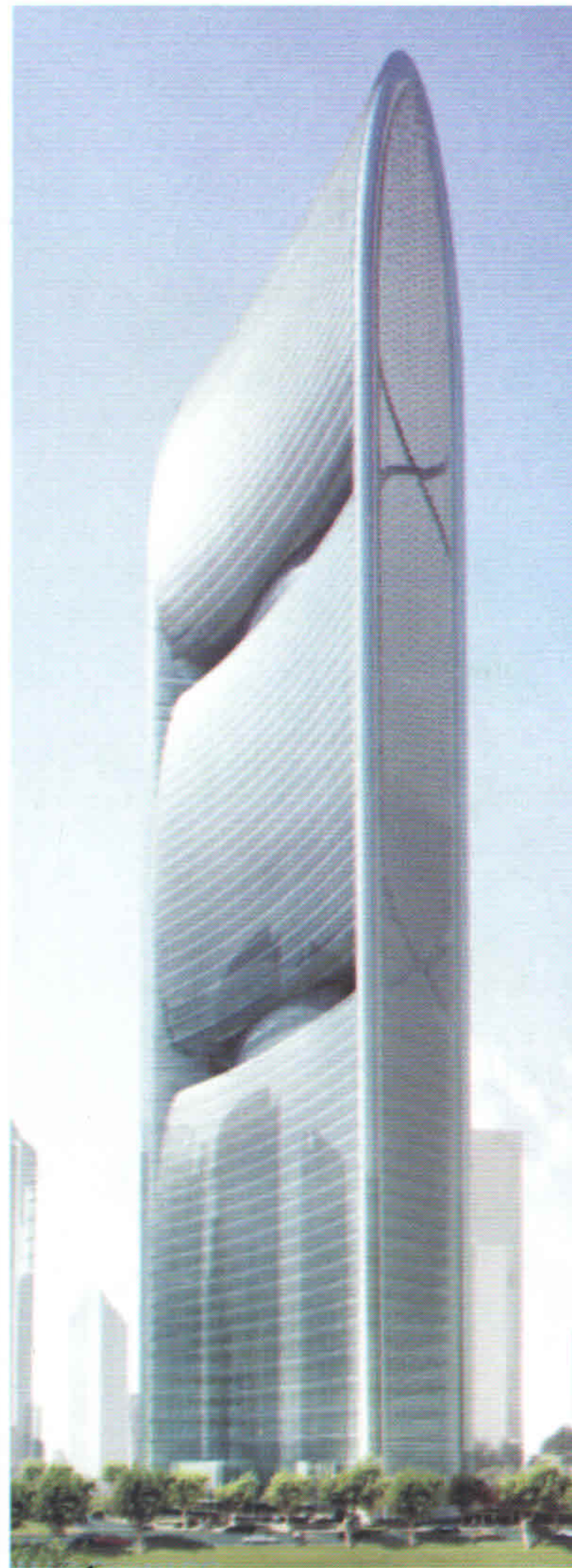
*60 glorious years*  
1947-2007

THE GUJARAT  
INSTITUTE OF  
CIVIL ENGINEERS &  
ARCHITECTS

# GICEA

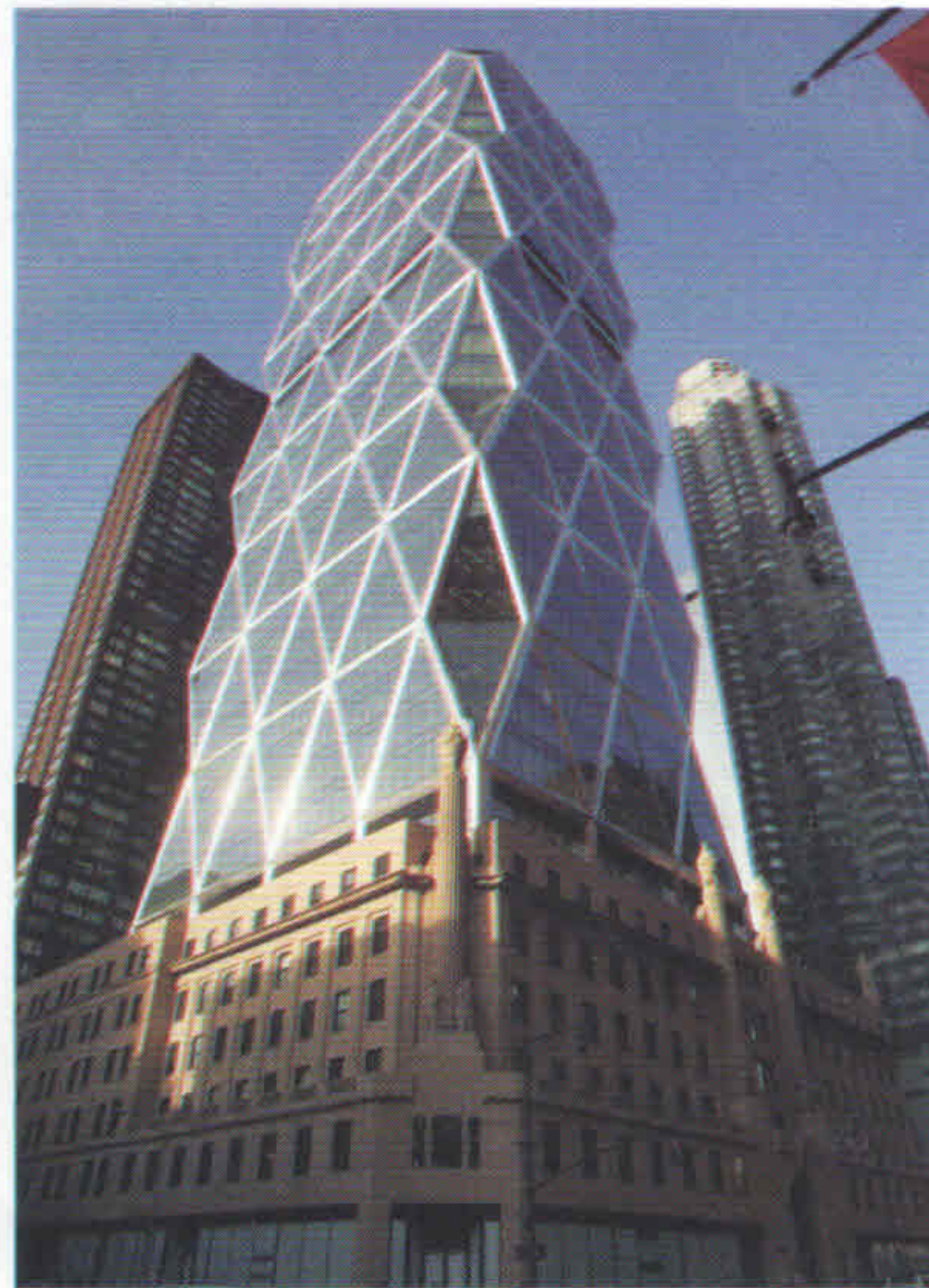
Vol. No. 74 | No.2 (2007-08) | January - 2008

N | E | W | S



❖ Top Ten  
GREEN  
Skyscrapers  
of the World

❖ Investors,  
line up for  
India's  
Real Estate







ESTD. : 1947

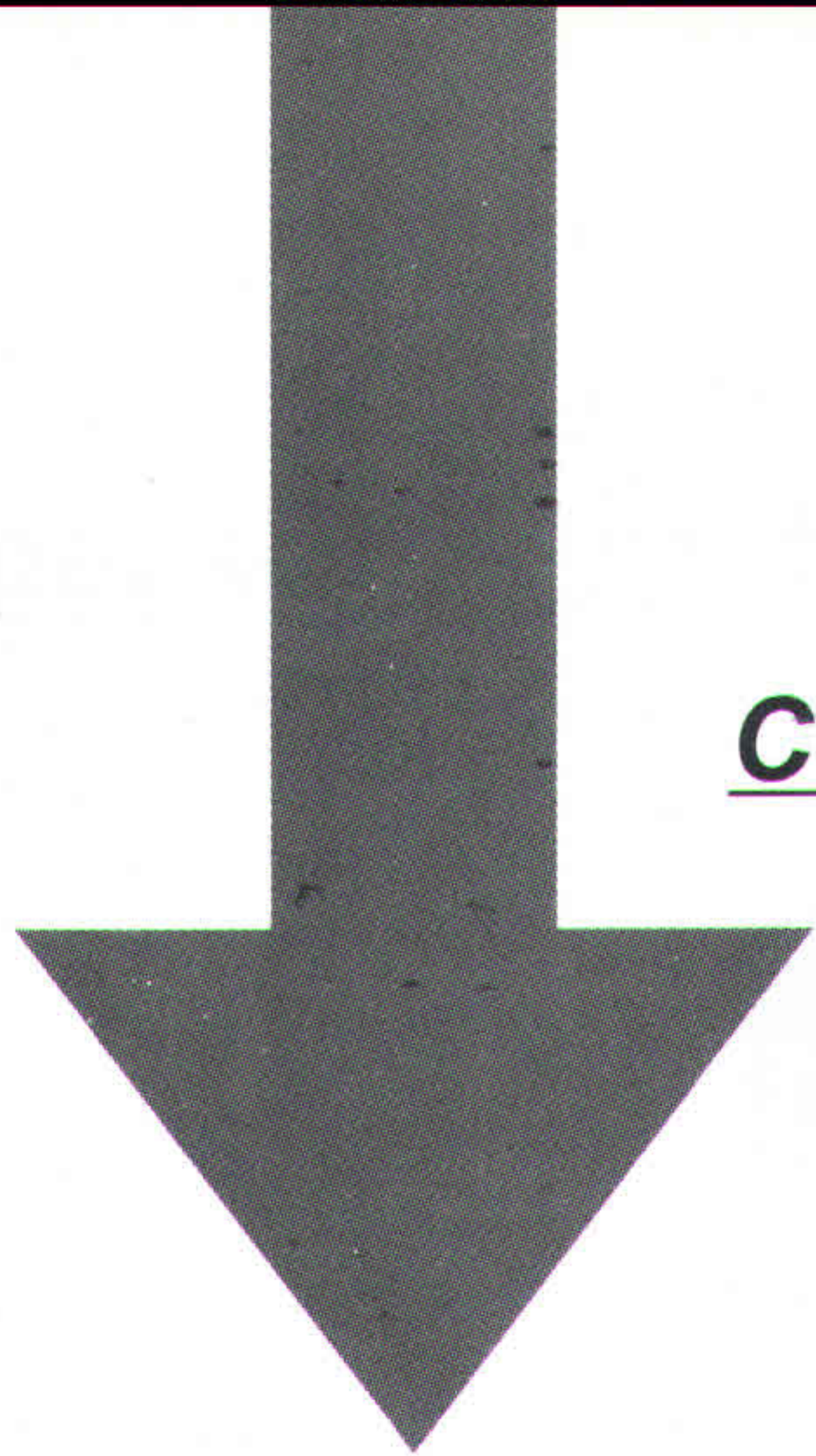
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Garba  
Celebration







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60 glorious years  
1947-2007

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# GICEA

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## Editorial



Dear Members,

The GICEA team made efforts to bring revival in the last issue. And with your support, we are proud that the beginning was made.

This issue, we are heading taller by going green with the ten green skyscrapers of the world. It is very interesting to know that how artistically the need of resolving earth's desperate need for 'balance', is taking shape all over the world. May it be the maximum city Mumbai or may it be our Manchester Ahmedabad, Indian Realtors too are making the "green" mania rolling.

"Go Green" concept is bringing together a vast array of practices and techniques to reduce and ultimately eliminate the impacts of buildings on the environment and human health. But effective green buildings are more than just a random collection of environmental friendly technologies. They require careful, systemic attention to the full life cycle of a building's materials, consumption, emissions and dependency on natural resources.

With latest technologies, increasing global exposure of people and with the high demand of nature to be preserved, the 'green' mission has started receiving hopes.

We hope you will enjoy this issue. Your feedback and support will make this initiative to bring revival be true.



Bansri Gandhi  
Technical Editor, GICEANEWS

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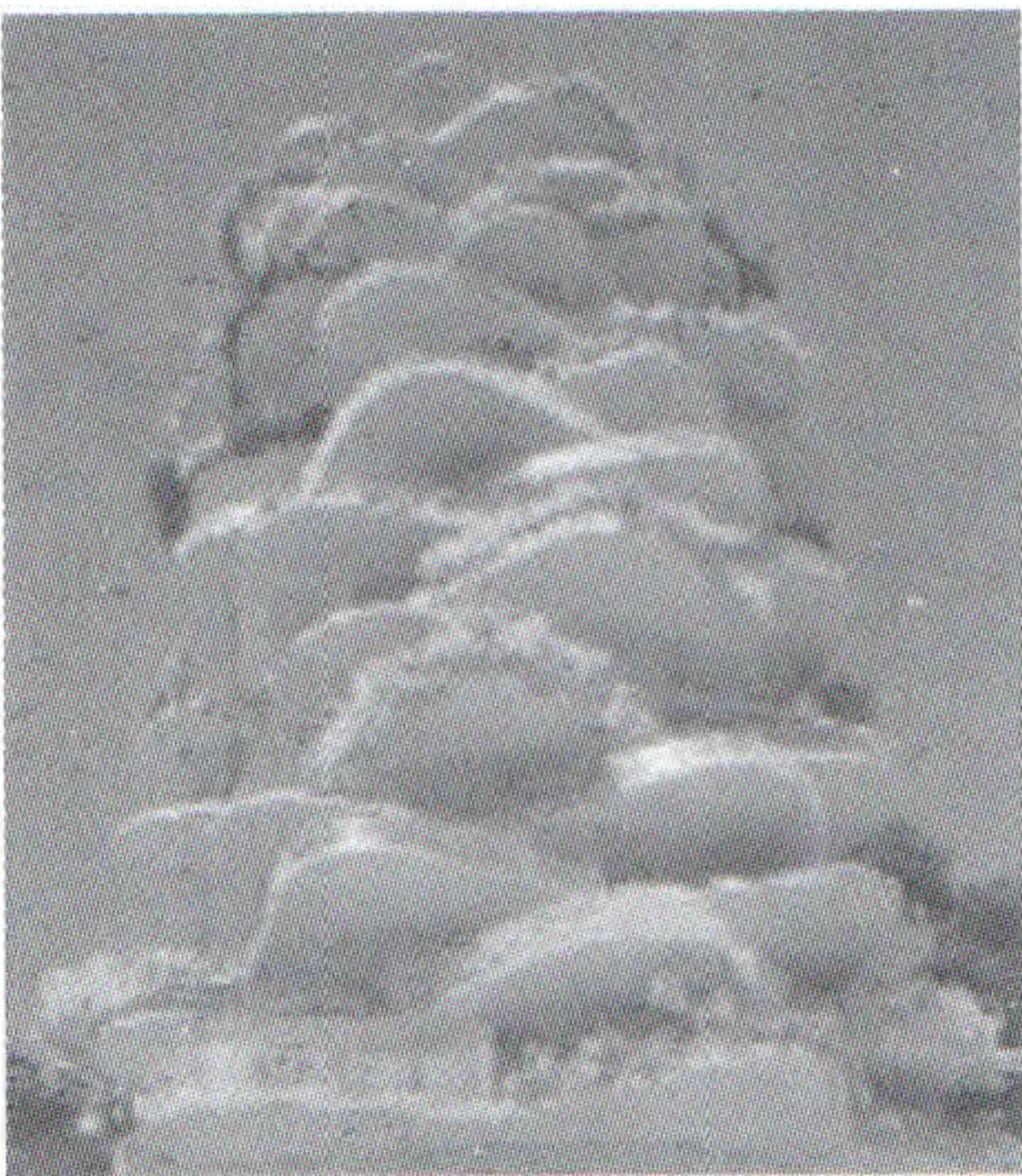
## Top ten Green Skyscrapers of the world

Courtesy: Jon Schroeder

*"Go Green" is the motto of the world today.*

*But today, we bring you buildings that are going TALLER and TALLER being Green. Each one contains many innovations that can make our world a cleaner & greener place. They build up, rather than out, and many of them are so GORGEOUS.*

### Presenting Top TEN GREEN skyscrapers of the world

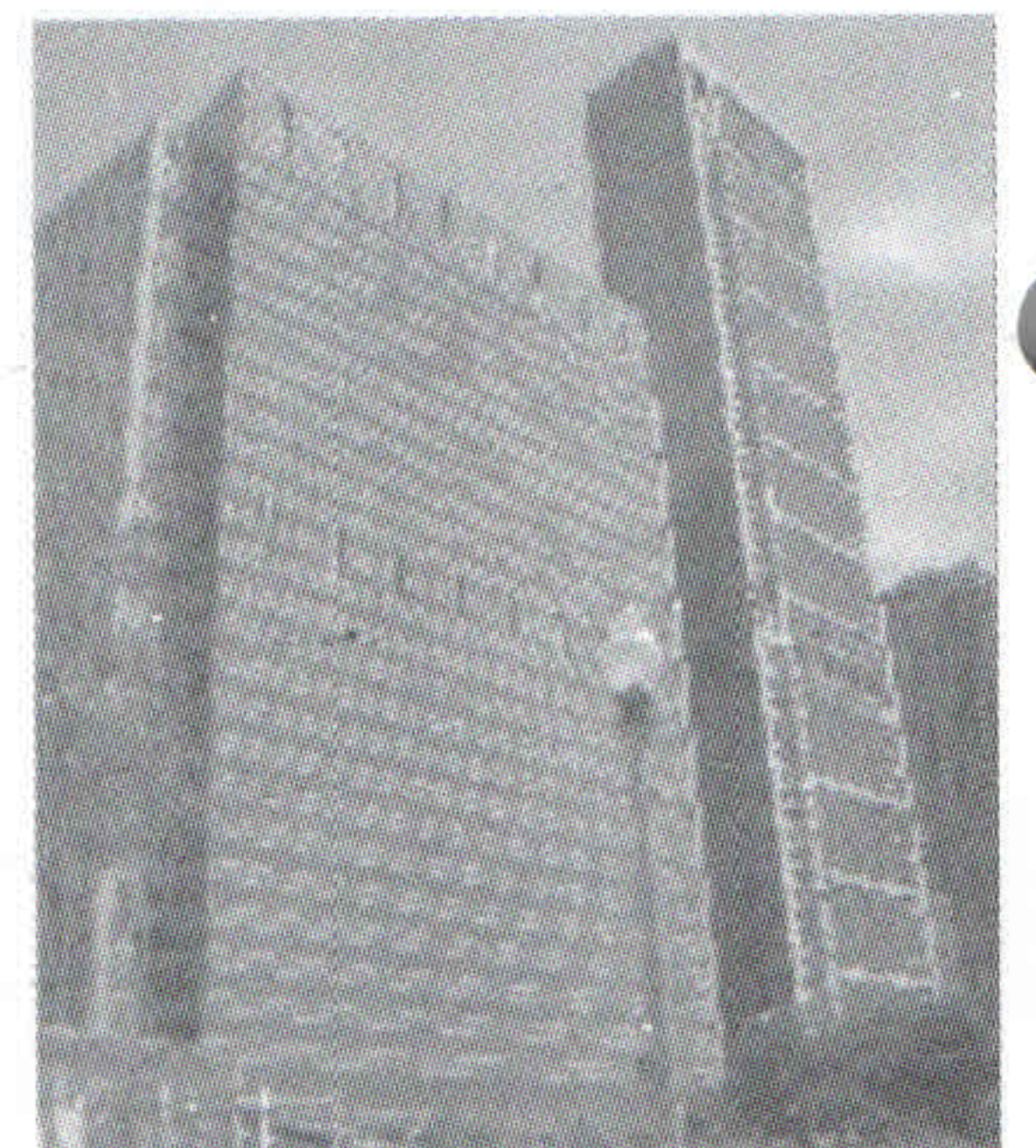


**Rank 10:**  
***The Urban cactus, Rotterdam***  
**Status: Under Construction**

The Urban Cactus is a residential project in the Netherlands that will offer 98 residential units on 19 floors. Thanks to the staggered design of the curvy balconies, each unit's outdoor space will get plenty of light from the sun. That means that this green skyscraper really will be green when all the residents' gardens are in bloom.

While this tower may lack in the technology department, its carbon-mitigation potential still looms high thanks to all the photosynthesis happening on the porch. Plus, its white color will help to mitigate the urban heat island effect.

**Rank 9:**  
***340 on the park, Chicago***  
**Status: Nearly Finished**



When 340 on the Park opens later this year in Chicago, it may become the first residential green scraper in the city to meet LEED standards.

The building is sure to be a wealthy green lover's dream-come-true. If you have \$700,000 to throw down on a 1600 square-foot condominium, you can enjoy low utility bills thanks to the building's fully insulated windows and rainwater capture system. And the most awesome amenity is the multi-storey winter garden starting on floor 25.



**Rank 8:**  
***Waugh Thistleton Residential Tower, London***  
**Status: On Drawing Board**

On the other side of the pond, the Waugh Thistleton Architects have an eco-residential building in the works as well.

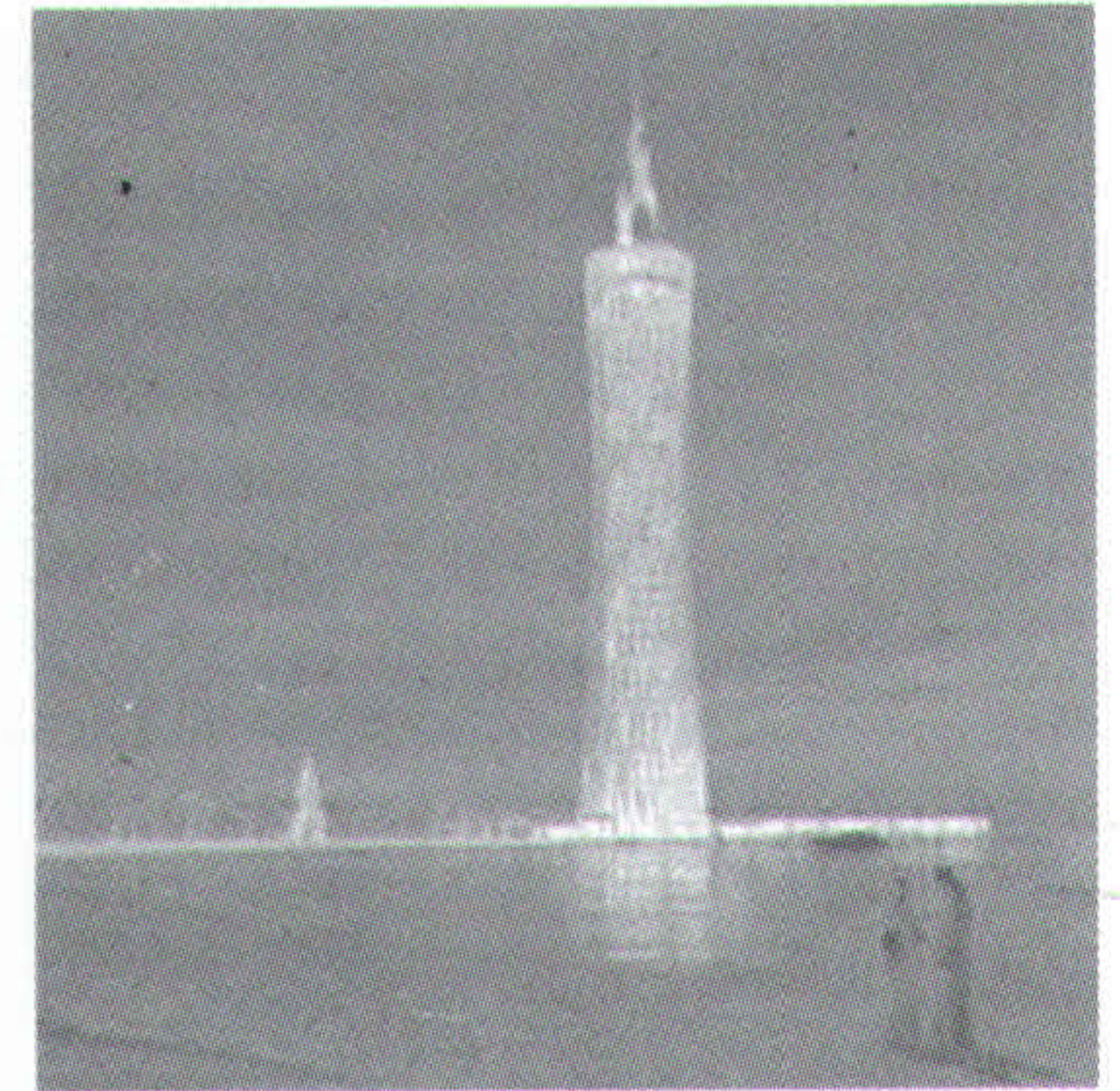
This design will employ helical wind turbine technology. Four turbines attached to one side of the tower have the potential to generate 40,000kW hrs a year, more than 15% of its energy needs.



**Rank 7:**  
***The Burj al-Taqa (Energy Tower),***  
***Dubai Status: On drawing board***

If this 68-story super greenscraper becomes a reality, it may become the tallest of all eco-towers, thanks to the proposed 200-foot wind turbine that will sit at the top of the building. Burj al-Taqa will occupy No. 22 on the world's tallest buildings list should it gets the green light.

Wind isn't this greenscraper's only green principle. Solar panels will cover a 1,61,459 square foot artificial island chain connected to the building and seawater will power Burj al-Taqa's air conditioners!



**Rank 6:**  
***The Hearst Tower, New York City***  
***Status: Open for business***



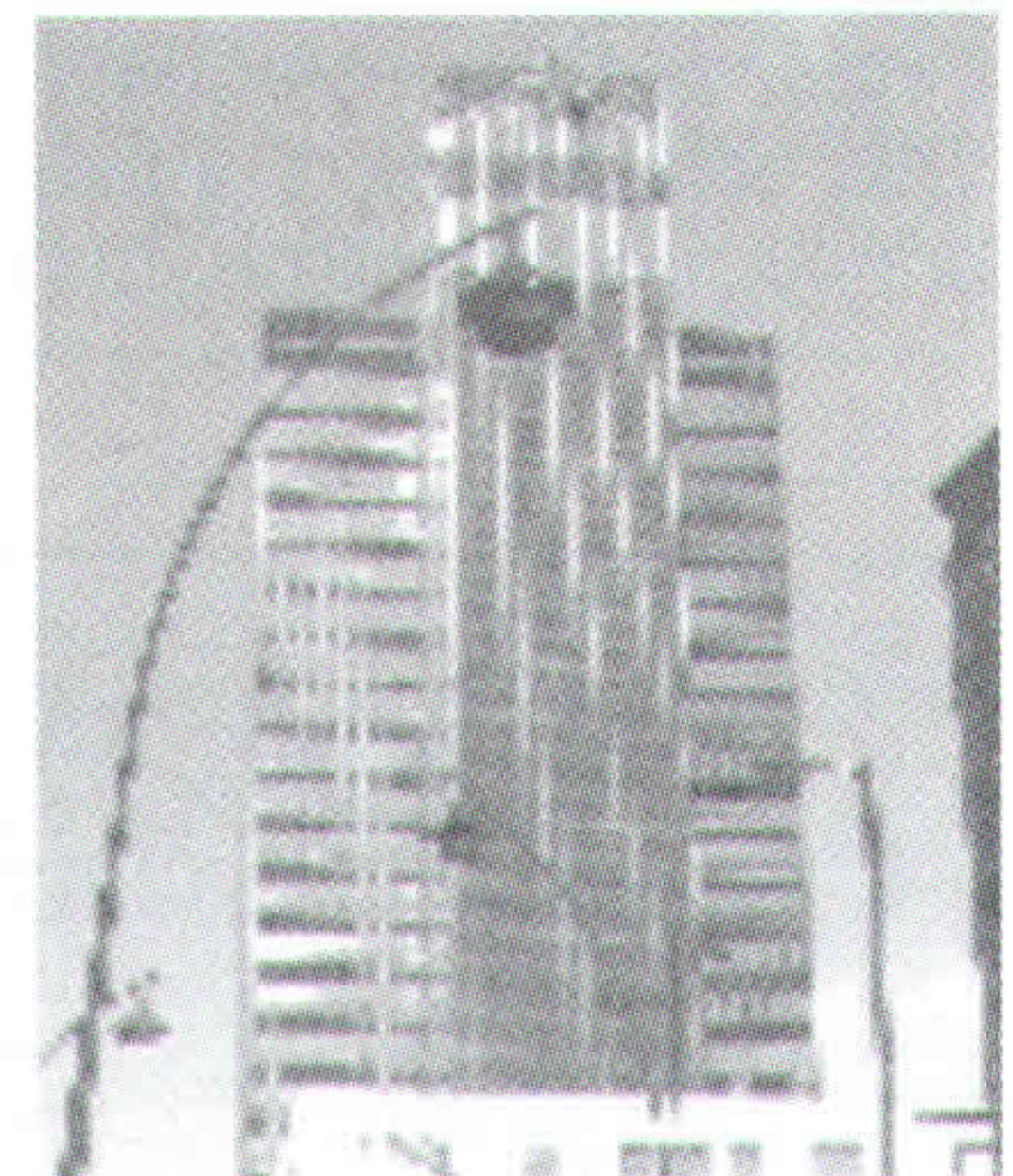
The Hearst Tower became New York City's first skyscraper to achieve LEED Gold accreditation from the USGBC when it opened its doors last year. 80% of the steel used to make the behemoth was recycled. On the inside, the floors and ceiling tiles are made from recycled materials as well. The diamond shapes on the building's facade aren't just for show either. The diagonal grid required fewer steel beams to achieve the same rigidity as a conventional skyscraper, and the design allows more natural light to enter the tower.

What's more, rainwater is collected on the roof and is funneled into a 14,000-gallon tank in the basement. The Hearst gathers enough water from the sky to account for 50% of the tower's usage. It's pumped into the cooling system, used for irrigating

**Ranks 5:**  
***The CIS Tower, Manchester England***  
***Status: Nearly Finished***

The CIS Tower outdoes the pretty much anyone in solar power utilization.

Weighing in with over 7,000 panels on the facade and 24 wind turbines on the roof, the CIS Tower will be able to produce 10% of its energy needs all on its own.



**Rank 4:**  
***The Lighthouse Tower, Dubai***  
***Status: On Drawing Board***



The Dubai International Financial Centre Lighthouse Tower plans to use 4000 photovoltaic panels on the south facing facade as well as three mega 225 kilowatt wind turbines to meet its electricity needs.

Other details are sparse, if it was under construction this definitely would have broken into the top three.





**Rank 3:**  
**Bank of America Tower, New York City**  
**Status: Under Construction**

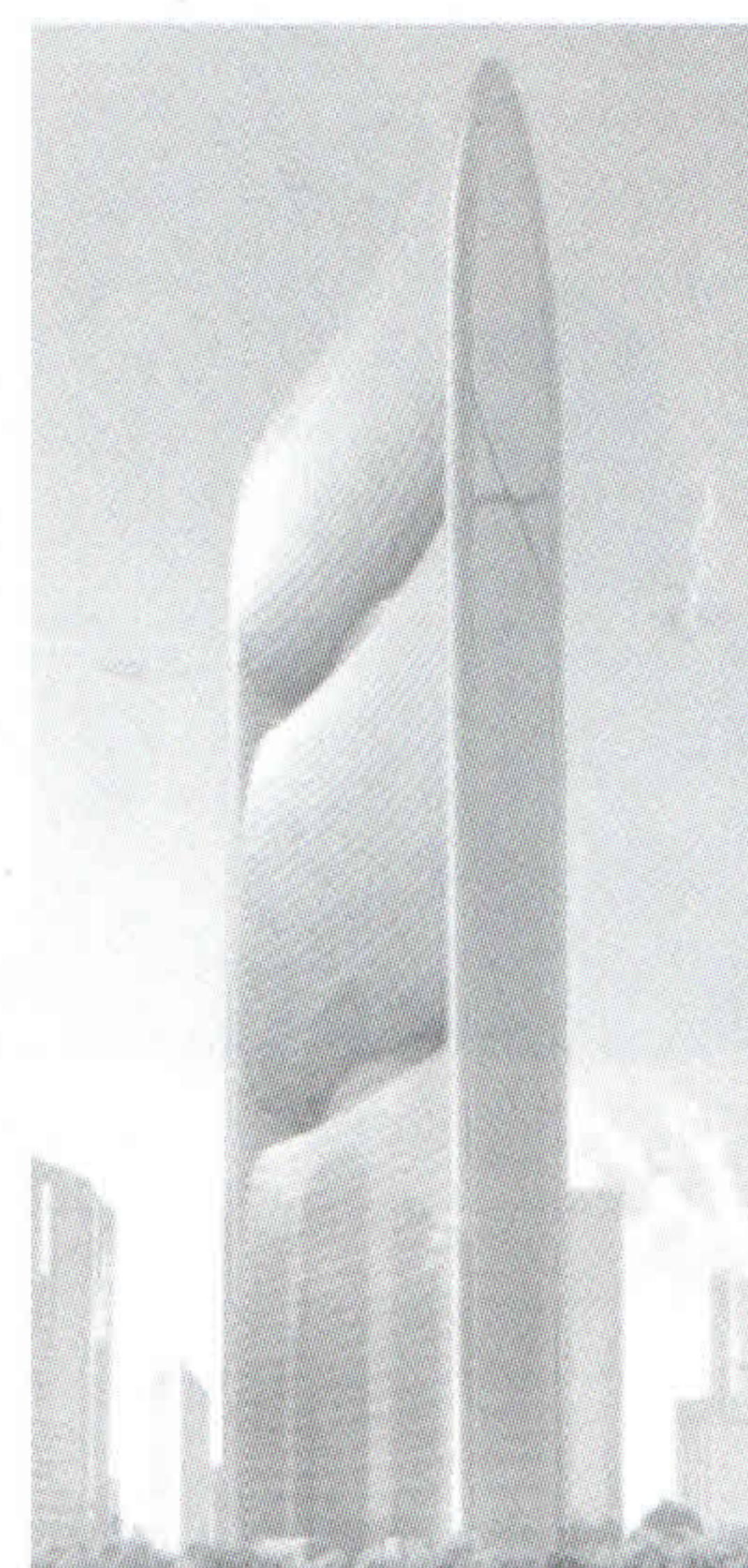
The designers of Bank of America Tower, Cook + Fox Architects, are hoping to one-up the Hearst Tower by going for LEED Platinum certification.

We'll see if they pull it off next year, when the building is slated to cut the red ribbon. Like the Hearst, The BOA tower will also use rainwater capture and floor to ceiling windows for natural lighting but it will also employ even more Eco friendly technologies. Natural gas fuel cells will create on-site electricity, and sunlight-sensing LED lights will maximize efficiency.

**Rank 2:**  
**The Pearl River Tower, Guangzhou, China**  
**Status: Under Construction**

Another greenscraper designed to harness winds at lofty heights, the Pearl River Tower will use internal wind turbines to keep the lights on.

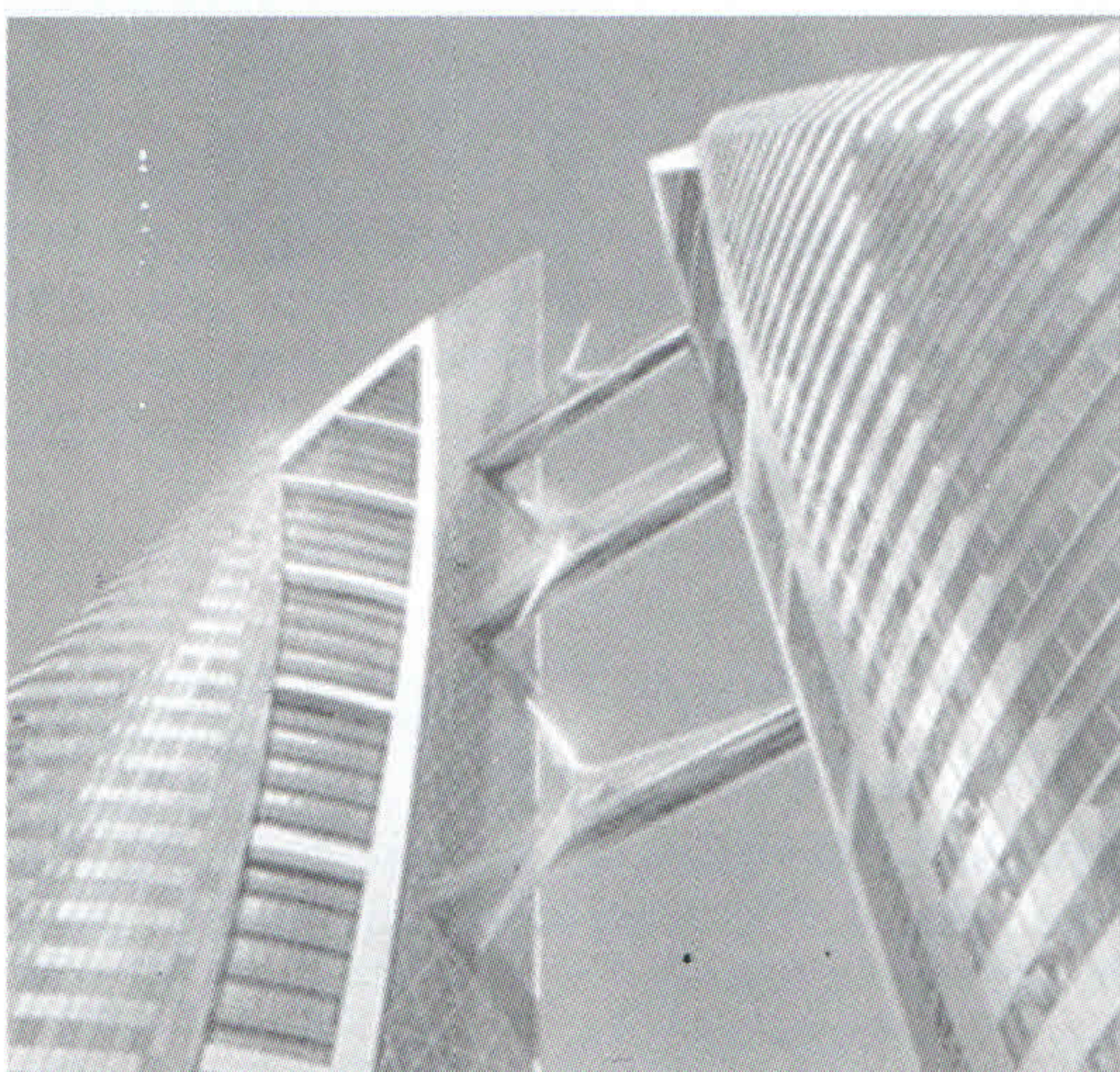
Fashioned like a giant wing, the tower pushes air through wind tunnels on two of the building's 71 stories. This eco-marvel of a building will also employ geothermal heat sinks, ventilated facades, waterless urinals, integrated photo voltaics and daylight responsive controls when it opens in late 2009.



**Rank 1:**  
**The Bahrain World Trade Center Towers, Kingdom of Bahrain**  
**Status: Under Construction**

Three 96-foot propellers suspended between the towers will supply the 42-storey spires with over 1100 megawatts per year. The shape of the building itself will create an accelerated airflow for the jumbo blades. Here are some virtual views of the Arabian Gulf from various levels of the building. Real views can be appreciated later this year, when the building opens.

Information for this article came from: The Skyscraper Museum ([skyscrapers.org](http://skyscrapers.org)), archidose, ecomoto.org, Jetson Green, Metaefficient, Inhabitat, dezeen, engadget, Trendhunter and TreeHugger





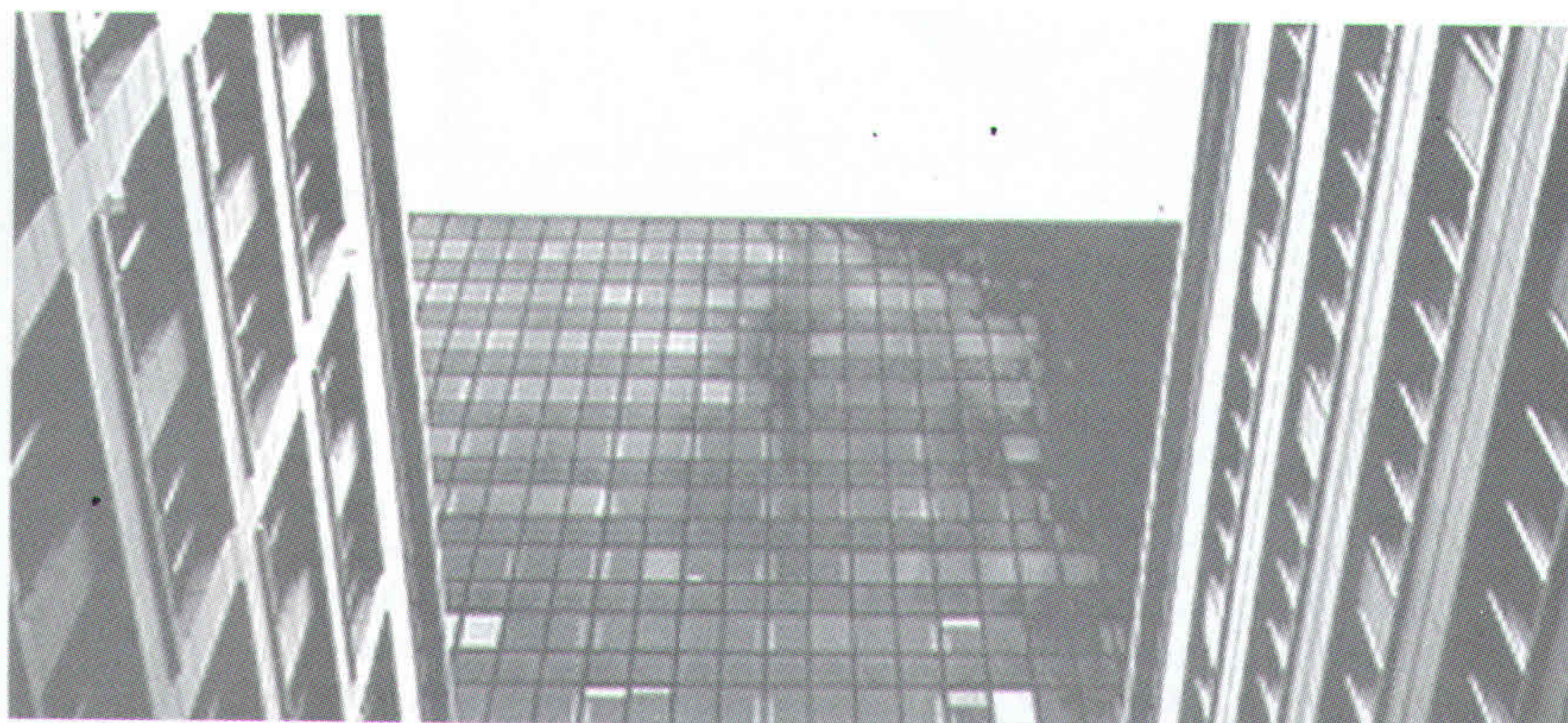
# Investors, line up for India's real estate

Contributed by Asia Times

## 2010 Realty Outlook

Real estate activity recorded a drop by 22% in year 2007 as compared to year 2006. This could be attributed to several reasons among which high interest rates and skyrocketing land prices definitely play a vital role.

Unlike the stock market, industrial and manufacturing sectors; real estate markets have witnessed zero correction over past year. While this has not happened the land prices did hold steady for a long period during the year 2007.



## Real Estate Activity by Market Players

AHMEDABAD

Year	Land Trading Volume (Urban - Peri-Urban)	Builders Projects Volume	Property Buying ( Investors, Offices, retail & Home seekers)	Bank Finance Disbursements/ FDI, NRI Finance	Market Growth (in comparison to previous year)
2001	Low	Low	Low	Low	-12%
2002	Low	Low	Medium	Low	-21%
2003	Low	Medium	Medium	Medium	+18%
2004	Medium / high	Medium	High	Medium	+35%
2005	High	High	Very High	Very High	+45%
2006	Very High	Very High	Very High	Very High	+29%
2007	Medium	Very High	Medium	Very High	-22%
2008*	Medium	High	High / Medium	High	+9%
2009*	Medium / Low	Medium	Medium / Low	Medium	-14%
2010*	High	High	Very High	High	+32%

## Real Estate Activity: Market Mood of the players for the future in the respective year.

AHEMDABAD

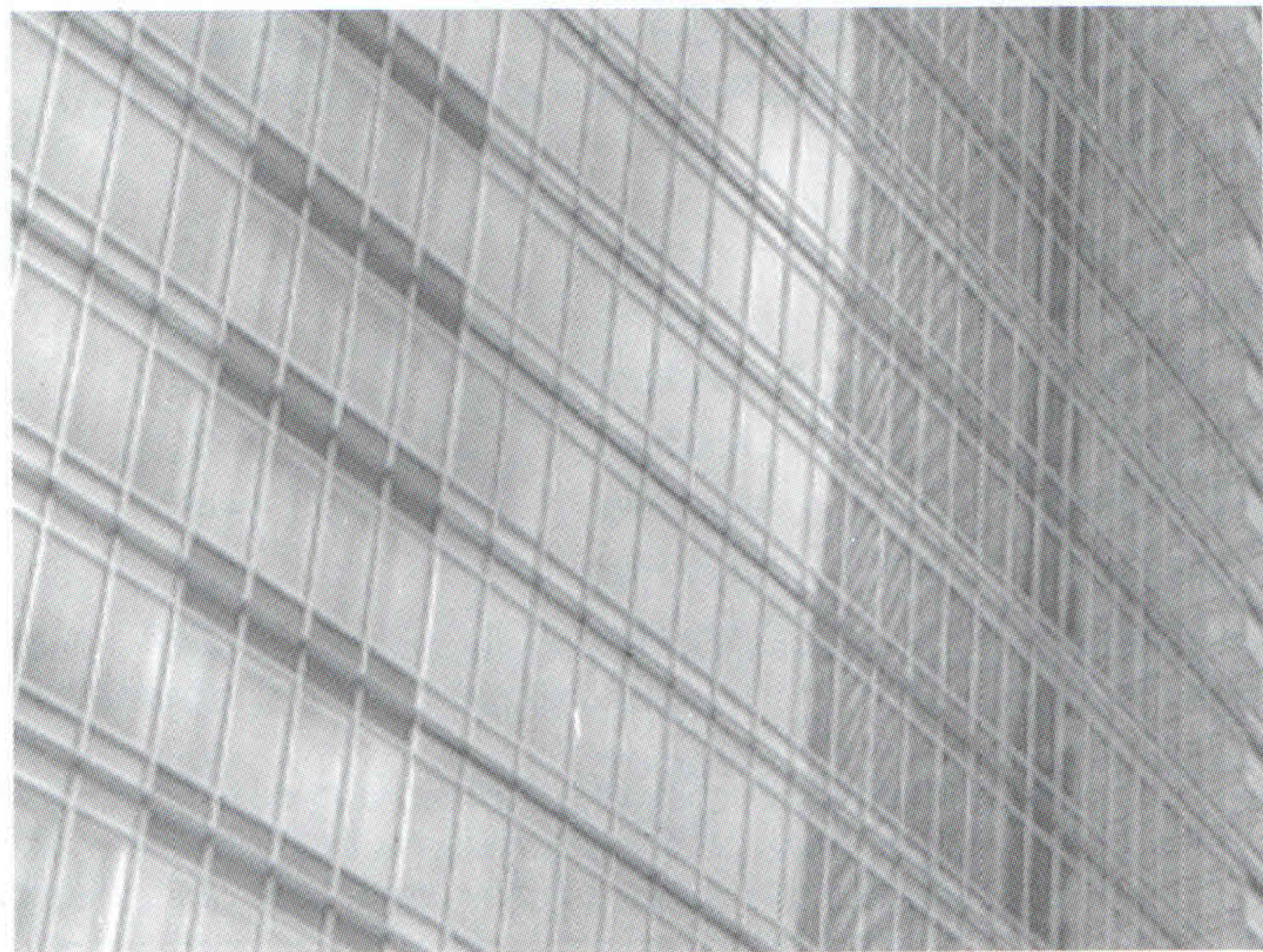
Year	Land Traders	Builders	Property Buying Investors	Finance Institutes/Fund Managers/ NRIs	Stock Market- SENSEX (aggregate year performance)
2001	Bearish	Bearish	Bearish	Bearish	Bearish
2002	Mixed	Bearish	Bearish	Bearish	Bearish
2003	Mixed	Mixed	Bearish	Bearish	Mixed
2004	Bearish	Bearish	Mixed	Mixed	Bearish
2005	Bearish	Bearish	Bearish	Bearish	Bearish
2006	Bearish	Bearish	Bearish	Bearish	Bearish
2007	Mixed	Bearish	Mixed	Mixed	Bearish
2008(proj.)*	Mixed	Bearish	Mixed	Mixed	Bearish
2009(proj.)*	Bearish	Mixed	Bearish	Mixed / Bearish	Mixed
2010(proj.)*	Bearish	Bearish	Bearish	Bearish / Mixed	Bearish



## Is the worst over?

The Post earthquake years 2001 and 2002 were the worst years in local real estate market over past ten years. The first decade of the new millennium started on a grim note. Past few years has seen a steady to phenomenal growth in the real estate sector all across the country.

The capital markets were successful in pumping money in the real estate with healthy returns which resulted in 45% growth in year 2005 and about 29% growth in year 2006, in the overall market activity of Ahmedabad. Going forward, this year does not look too bad for the sector as well. Our projections reveal that market is likely to witness medium to low activity in year 2009 before it goes in high gear again in year 2010. With these numbers it can be said the worst for this decade is over and there are even brighter days ahead.



## Is the worst yet to come?

This year (2008) will be decisive in how the markets shape up for the future. A steady 2007 proved that markets have matured with no panic selling seen in the realty sector.

As a matter of fact several companies went IPOs from the real estate sector and infrastructure sector (DLF, Omaxe, Adani Mundra Port SEZ, etc. to name a few) and investors welcomed these with high premium offers.

This only proves that 2007 brushed off any negative sentiment that could have been prevalent in the industry due to late year state election polls. The ruling government making a clean sweep with a majority has set administrative and development prospects in place for the next five years which has send cheers to the overall market mood.

Majority of builders are positive and are in bullish mood for the future market as new projects are launched with a rising demand for quality housing and business. All these indicate the worst may not come in near future.



## Is the Best over?

While everyone is hoping a repeat of year 2006; which recorded the highest growth and not surprisingly also the highest land price appreciation, this may not happen in the period till 2010, the simple reason being the market activity banks heavily on the real estate price index and the population income index which are not moving along in sync since last couple of years.

The real estate price index for the city has shown a three times increase against a two times increase in the income levels.

This has led to imbalance in actual demand and supply as housing is proving to be affordable for few and a luxury to many. Which means the best for this decade is likely over despite a strong growth projected in year 2010.

## Is the Best yet to come?

FDI and NRI funds have made formal inroads in Gujarat Realty sector. A couple of township projects and few SEZs are already mobilizing its resources to speed up construction.

These mega projects will have a huge impact on overall realty market of the city. But more so, they are also likely to create more jobs, boost economy, attract capital and most importantly; promote migration to the city.

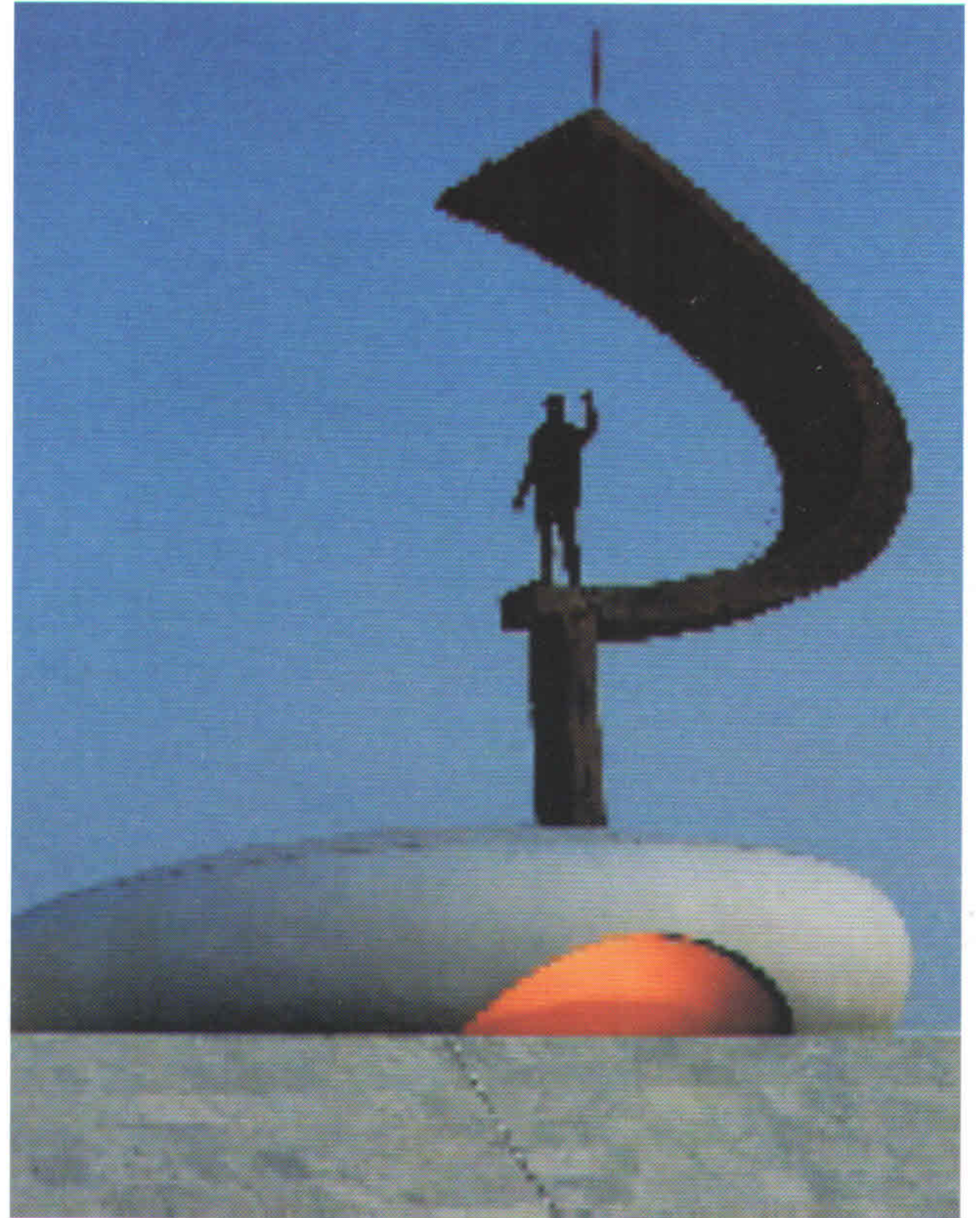
The coming decade is most likely to be a revolutionary phase and is likely to have many surprises in store for the market players. As of now the mood is bullish as everyone is eying a large economy at hands for the city.

N.K. Patel, Director  
Jigar Pandya, COO  
RESMA  
[www.resma.org](http://www.resma.org)



## J K Memorial, Brasilia

Narrated By: Bansri Gandhi, GICEA editor



Juscelino Kubitschek was a Brazilian president from 1956 – 1961. His term was marked by relative economic prosperity and political stability, being most known by the construction of a new capital, Brasília.

**This remarkably shaped monument - JK Memorial was built in 1980.**

***It is a museum in the city of Brasilia designed by Oscar Niemeyer, opened in September 12, 1981 and is dedicated to former Brazilian President Juscelino Kubitschek.***

Inside JK memorial, are the body of JK, many of his belongings as their personal library, and pictures of both him and his wife Sarah.

Around the memorial, the works designed by Athos Bulcão, artist Marianne Peretti and a sculpture of 4.5 meters authored by Honório Peçanha are beautifully presented.

JK memorial, in different lights, moods and picturesque setting, gives a proud homage to the former president of Brazil.





60 years of Celebration



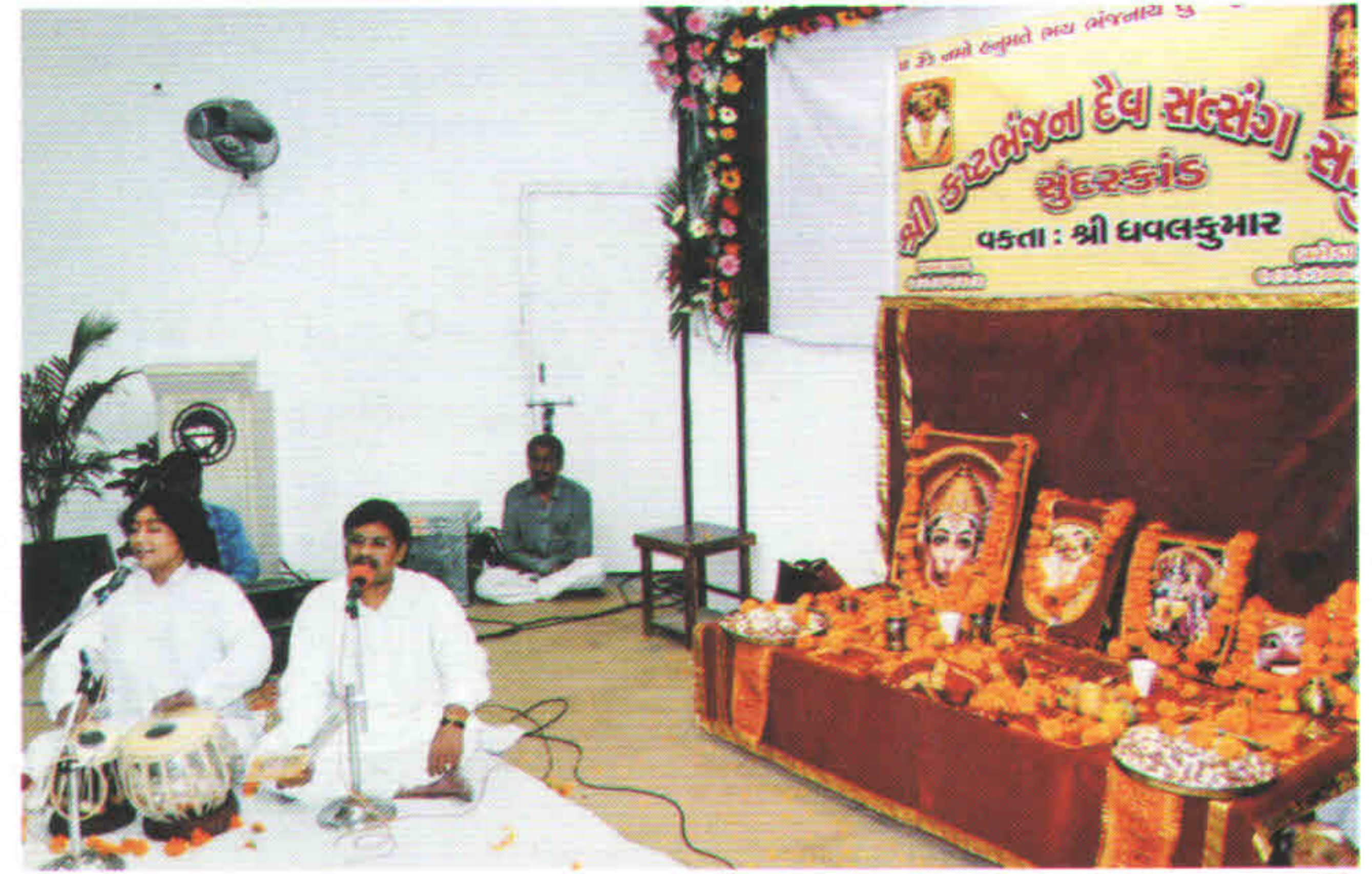


# EVENTS

EVENTS



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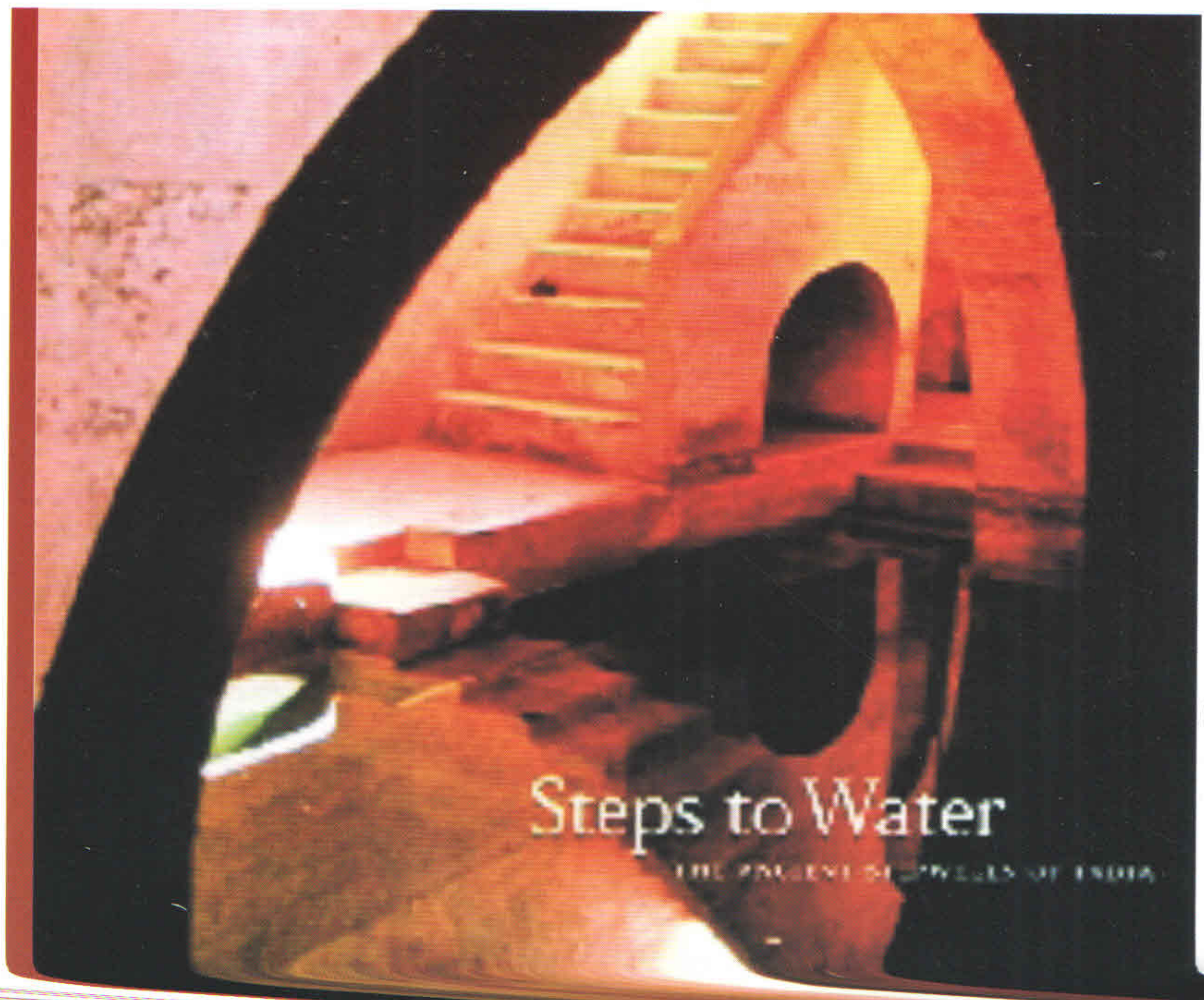


## Steps to Water

Author: Morna Livingston

Review by: Ar. Shubhra Kothari

A book with chapters like  
'Waiting for Rain'....  
'Babur and the  
bathhouse'... 'Running  
on Empty'... 'A walled  
garden'.....**steps to**





# High Performance Concrete

An Answer to build Sustainable Structure



## Preamble :

The expectation of designers and construction from concrete is day-by-day increasing as such the new applications of concrete is evolving with time.

The article brings out several issues which can crop up when an engineer aims to design a concrete mix which can perform for a very long period of time even in aggressive environment.

The basic definition of High Performance Concrete (HPC) was discussed in the previous issue. The high performance concrete ensures the long time ability to resist aggressive environmental condition, abrasion and all other deterioration process.

In fact the philosophy of HPC is the design of concrete mix should be strength through durability rather than durability through strength.

## The Need :

Unacceptable rates of deterioration in many recently constructed buildings, bridges and infrastructure projects exposed to hostile environments have caused great concern the world over.

In view of the above, HPC is required as a construction material in structure constructed in very severe environment.

The structures like tunnel in sea beds, offshore structures, jetties, high rise buildings, chimneys, towers and foundations in aggressive environment needs high performance concrete.

## The Specifications :

Concrete to classify as HPC should be able to comply with the requirements of impermeability and dimensional stability.

**Impermeability :** It is extremely important the concrete should be dense and impermeable to avoid penetration of moisture and harmful chemical ions which can cause expansive reaction within the concrete and reduces the durability of concrete in a few years of service life. HPC should have a very low co-efficient of permeability i.e.  $1 \times 10^{-14}$  metre / second.

Chloride ion permeability test (AASHTO277) is found to be more practical ASTM C 1202 classifies chloride ion permeability test.

When charge passed (Coulombs) passed through concrete is greater than 4000 than concrete is said to be highly impermeable, when it is less than 100, than concrete is virtually impermeable.

**Dimensional Stability :** Dimensional stability depends on the main characteristics of concrete like High Elastic Modulus, Low Thermal Strain, Low Drying Shrinkage and Low Creep. This can be achieved by using suitable materials in correct proportions. Creep and Drying Shrinkage are highly dependent on aggregate types and contents.

To achieve high dimensional stability, it is desirable to reduce the magnitude of the strength by limiting the volume of the cement paste in concrete and by using aggregates having high strength and high elastic modulus.

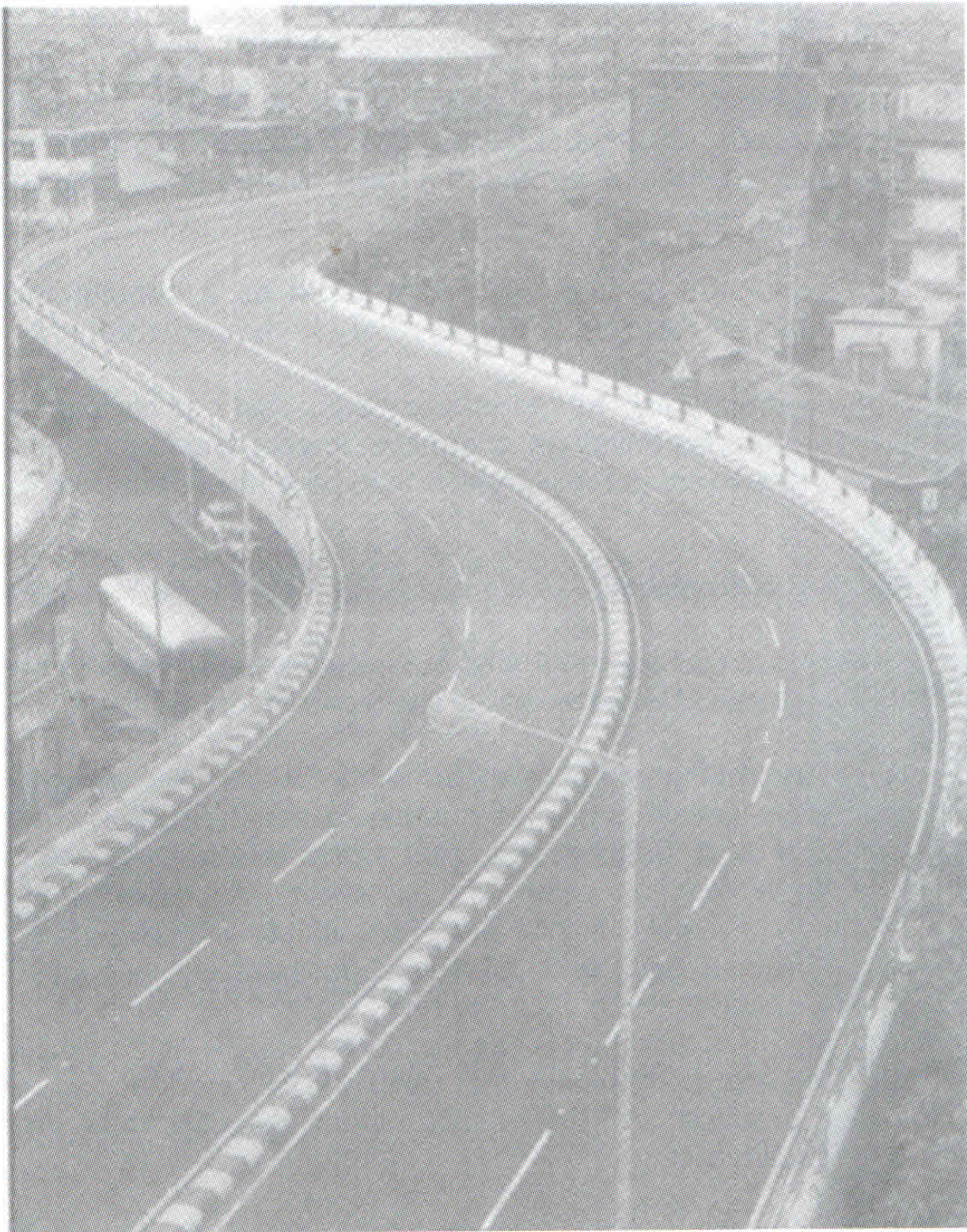
## The Critical Parameters :

The HPC is a multi component material compared to conventional concrete, hence special attention needs to be paid for selection of concrete ingredients, concrete mix proportions and production methods, durability and sequence of mixing component materials.

## HPC Ingredient and Influence :

**Aggregates :** The fine aggregates with the fineness modulus between 2.5 to 3 are generally considered adequate. Coarse





aggregates should have equidimensional particles obtained by crushing the dense igneous rock.

In HPC aggregates – cement paste interfacial zone is strong, so it is very important to ensure that aggregates should not be the weak link as far as strength is concerned. Generally, 10 to 15 mm MSA size is considered optimum to eliminate the chances of micro cracks, large pores and inclusion of soft materials in aggregates.

## Cement

Minimum water demand for given consistency of the cement paste is a primary consideration in the selection of cement paste for making HPC. This will help reducing the volume of capillary pores which is the entry link for moisture, gas or other chemical ions.

Blended cement would be perhaps be a better option to avoid loss of workability and ensures secondary hydration to fill capillary pores. Studies have shown that 35% of cement paste by volume, in HPC, represents an optimum solution in balancing the conflicting requirements of strength, workability and most importantly dimensional stability.

## Mineral Admixtures

The mineral admixtures are indispensable in HPC since these admixtures improve the rheological properties of concrete such as cohesiveness and stability.

It also helps improve impermeability of concrete and the strength

development with age. The widely used mineral admixtures in our country are siliceous by product or GGBS, Fly Ash and now Condensed Silica Fume (micro silica).

The essential factor to be looked in to mineral admixtures are fineness, particle size, pozzolanic and / or cementitious characteristic, degree of uniform dispersion and curing conditions.

It is recommended that using combination of 10% micro silica with 15% fly ash / slag by volume is giving excellent particle packing effect in the concrete.

**Chemical Admixtures :** Chemical admixtures are mainly used for dispersion of all fine particles in the mix, reduction of water content for desired work ability, improving consistency, preventing slump loss at early age and providing protection against deterioration by freezing and thawing cycles.

It is recommended that super plasticizers or high range of water reducing chemicals should only be used in HPC. The dosage of super plasticizers will have to be calculated considering weight of solids presents in the solution.

While, the water content in the super plasticizers must be accounted for in the water to binder ratio of the mix.

**Water Content :** It is observed world wide that there is inverse relationship exists between water content and concrete strength in case of HPC.

The relationship of HPC strength at 28 days and maximum water content can be exploited for prediction and control of concrete compressive strength from the table given below.



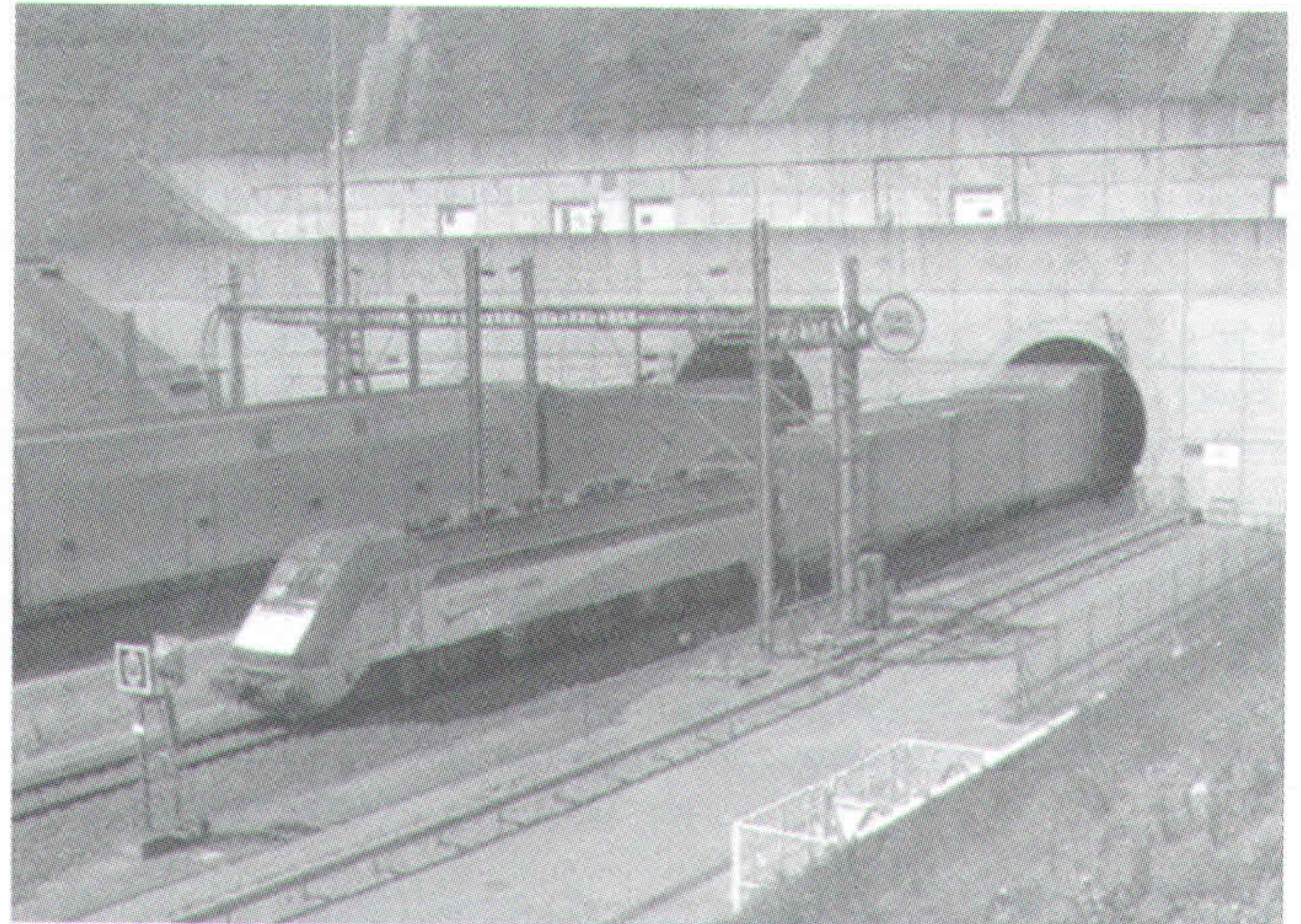
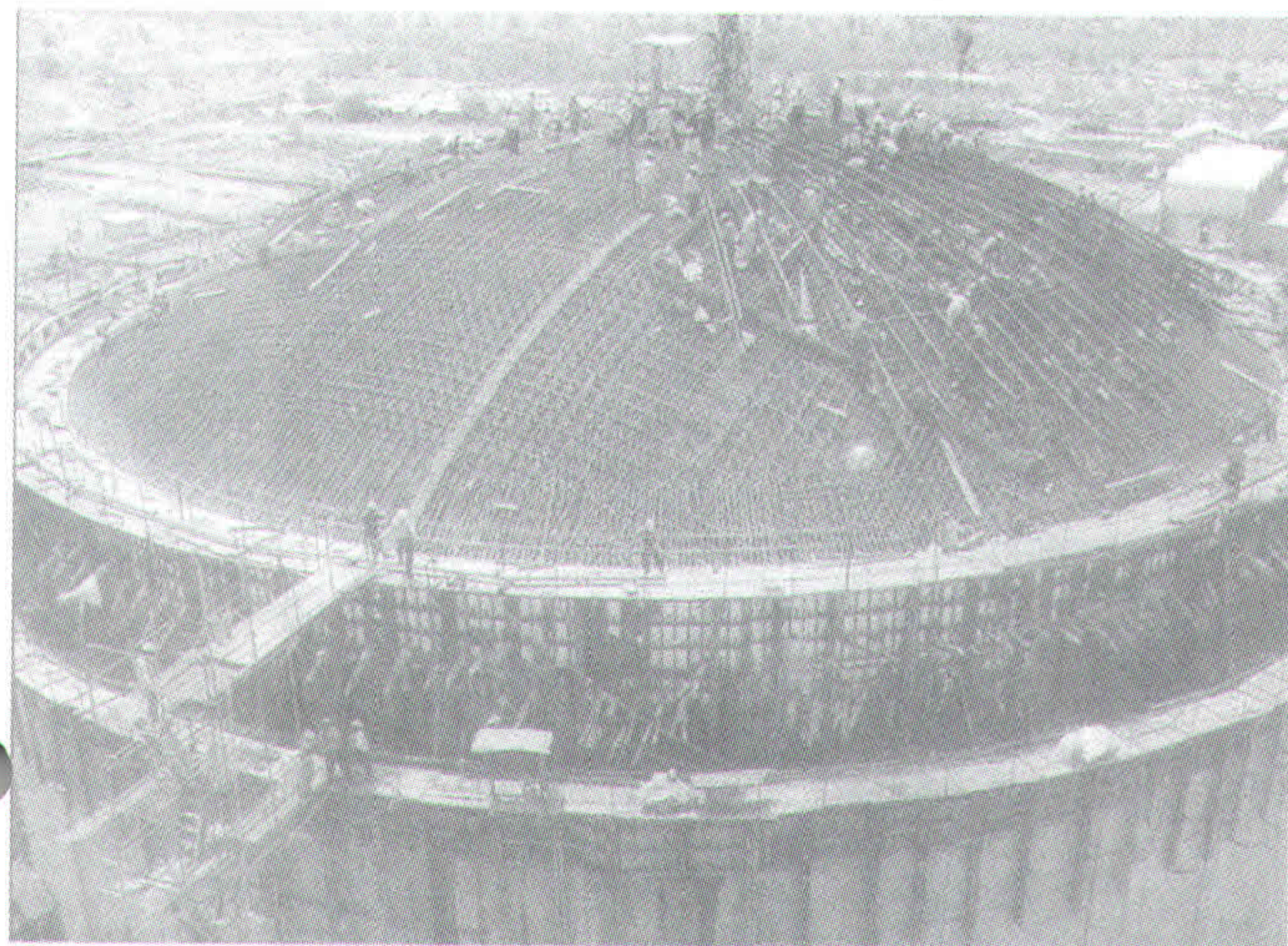


Strength Grade	Average Compressive Strength at 28 days (MPa)	Maximum Water Content (kg/m <sup>3</sup> )
A	65	160
B	75	150
C	90	140
D	105	130
E	120	120

#### Sequence of Batching Different Ingredient of HPC :

The basic objective to follow the sequence in addition of various constituents of HPC is to prevent local concentration of voids and ensuring dispersion of fine aggregates uniformly in mix. This also prevents micro structural weak link in the concrete. The general sequence may be followed as given below.

1. At first coarse and fine aggregates in the mixture
2. Next, add cementitious materials (cement & mineral admixtures)
3. Then add 80% of water
4. Chemical admixtures mixed with balance quantity of water



#### The Case Studies of HPC Application :

There are many structures constructed with HPC in our country and world over. The features of few structures where HPC is used are given below.

Project	Main Features	Selection Criteria for Concrete Mix Parameters	Compressive Strength
311 South Wacker Tower, USA	<ul style="list-style-type: none"> <li>➤ 293 metre high – 70 Storeys.</li> <li>➤ Concrete pumped using only one pump up to full height.</li> </ul>	<ul style="list-style-type: none"> <li>➤ High strength</li> <li>➤ Reduction in column size</li> <li>➤ Pumpability</li> </ul>	72 MPa to 88 Mpa



Project	Main Features	Selection Criteria for Concrete Mix Parameters	Compressive Strength
EURO Tunnel, UK / France	<ul style="list-style-type: none"> <li>➤ Link between UK and other European Countries.</li> <li>➤ Total length 51 kms. Including 37 kms. below sea.</li> <li>➤ Design life 120 years.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Extremely low permeability.</li> <li>➤ Low thermal cracking.</li> <li>➤ Workability retention. Cohesiveness and Pumpability</li> </ul>	70 MPa to 80 Mpa
Akashi Kaikyo Bridge, Japan	<ul style="list-style-type: none"> <li>➤ Longest suspension bridge in the world.</li> <li>➤ Having suspended span of 1.99 kms. &amp; total length of 3.9 kms.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Minimum thermal cracking.</li> <li>➤ Low heat generation. High strength and workability.</li> <li>➤ Aggressive Environment</li> </ul>	60 Mpa
Kaiga Atomic Power Project, India	<ul style="list-style-type: none"> <li>➤ Pre-stressed concrete vertical wall of 43 metre height.</li> <li>➤ Pre-stressed concrete segmented hemi-spherical dome.</li> <li>➤ Mitigate the effects of radio active rays on operating staff, public and environment.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Ability to withstand Irradiation effect and good rheology.</li> <li>➤ Low shrinkage and creep.</li> <li>➤ Low permeability Low heat of hydration</li> </ul>	60 Mpa
Urban Viaduct, Mumabi	<ul style="list-style-type: none"> <li>➤ 1.9 kms. length 56 spans.</li> <li>➤ Concrete Quantity : 20,000 m<sup>3</sup></li> <li>➤ Use of HPC of M75 grade concrete for the first time in Urban Viaduct in India.</li> </ul>	<ul style="list-style-type: none"> <li>➤ High strength Durability.</li> <li>➤ Good surface finish Slump retention in warm to hot climate.</li> </ul>	75 Mpa
Petronas Tower, Malaysia	<ul style="list-style-type: none"> <li>➤ 98 Storeys.</li> <li>➤ 216901 sq.metre floor area.</li> <li>➤ Design life : 100 years.</li> </ul>	<ul style="list-style-type: none"> <li>➤ High strength Durability</li> <li>➤ Slump retention.</li> </ul>	80 Mpa

## Conclusions :

HPC mixes require superior quality materials, methods and supervision and is to be used for specific structures to meet the specific criteria. It may happen that concrete regards as HPC today will in future be considered as normal concrete and HPC will be redefine in future.

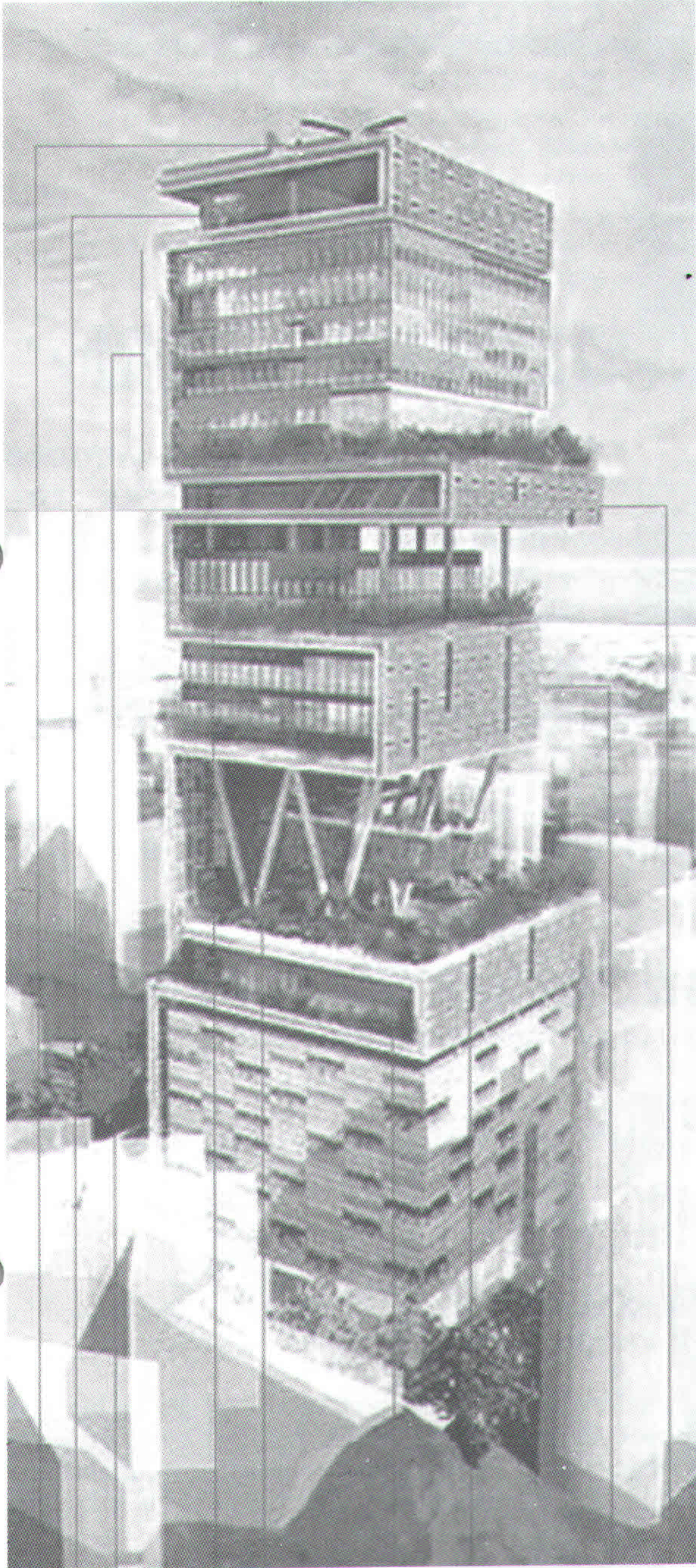
Concrete technology is very dynamic and always displaying new, interesting and often exciting phases. Today, studies are being done by Researchers and Technologists on concrete durability and new dimensions such as particle packing, interfacial zones, transport mechanisms & binding capacity along with the need for sustainability.

Complied by....  
Umesh Soni, GM (Customer Support)  
Ambuja Cements Ltd.  
Reference....  
Technical Publication No. 83  
of Ambuja Technical Literature Series.





# The Green Skyscraper of Mumbai



## Taking 'green' building to the next level ?

A new building project in Mumbai is being billed as one of the greenest buildings in the world. The 27 story Antilla building is being built for Reliance Industries Ltd, India's largest private sector company. The building will be covered in foliage, with living walls enclosing all four sides, hanging gardens and a green rooftop.

Although the Antilla building is being billed as of the greenest buildings in the world, apart from obviously being green on the outside, there is still some debate about the true green credentials of the project. So far the architects of the project have not disclosed whether or not the building will be developed using sustainable materials and practices.

A spate of green skyscrapers have shot up in the last few years, as people learn that buildings account for more CO<sub>2</sub> emissions than any other single source. At the same time, we've seen a rise in green washing by companies recognizing the market value of green and making false claims to fit the category. In an exemplary meeting of these two trends, we have just discovered a building in progress in Mumbai that calls itself the greenest of all the buildings in the Maximum City of 13 million people. If ever there were a literal interpretation of a deceptive green façade, this is it.

Renderings of the 27-story Antilla building depict a highrise that couldn't be greener. It's covered in foliage, with living walls enclosing all four sides, hanging gardens and green rooftop. Just a few days ago, the architects boasted about its environmental features – primarily that the walls of plants will increase green space and combat urban heat island effect. But look behind the green façade, and as far as we can tell, there's nothing else sustainable about the materials or construction. Architecture firm Perkins + Will doesn't include the project on their site, but this week mentioned no other green features besides the literal green.

The Antilla is being built for Reliance Industries Ltd, India's largest private sector enterprise (with revenues exceeding \$25 billion), and the Ambani family, who own the company. Reliance is a petrochemical corporation whose earnings come from exploring, producing, refining and marketing oil and gas. They are the world's largest producer of polyester fiber, and a runner-up for several others.

The building will stand on Mumbai's Altamount Road, where real estate costs as much as \$1800/square foot. Although Mumbai is the densest city in the world, with almost 30,000 people per square kilometer, this 500+ foot tall building will only be 27 floors where normally a building of this height would be 60, so that each floor can have exceptionally high ceilings, and 35,000 square feet of the entire building area will be the residential quarters of the Ambani's.

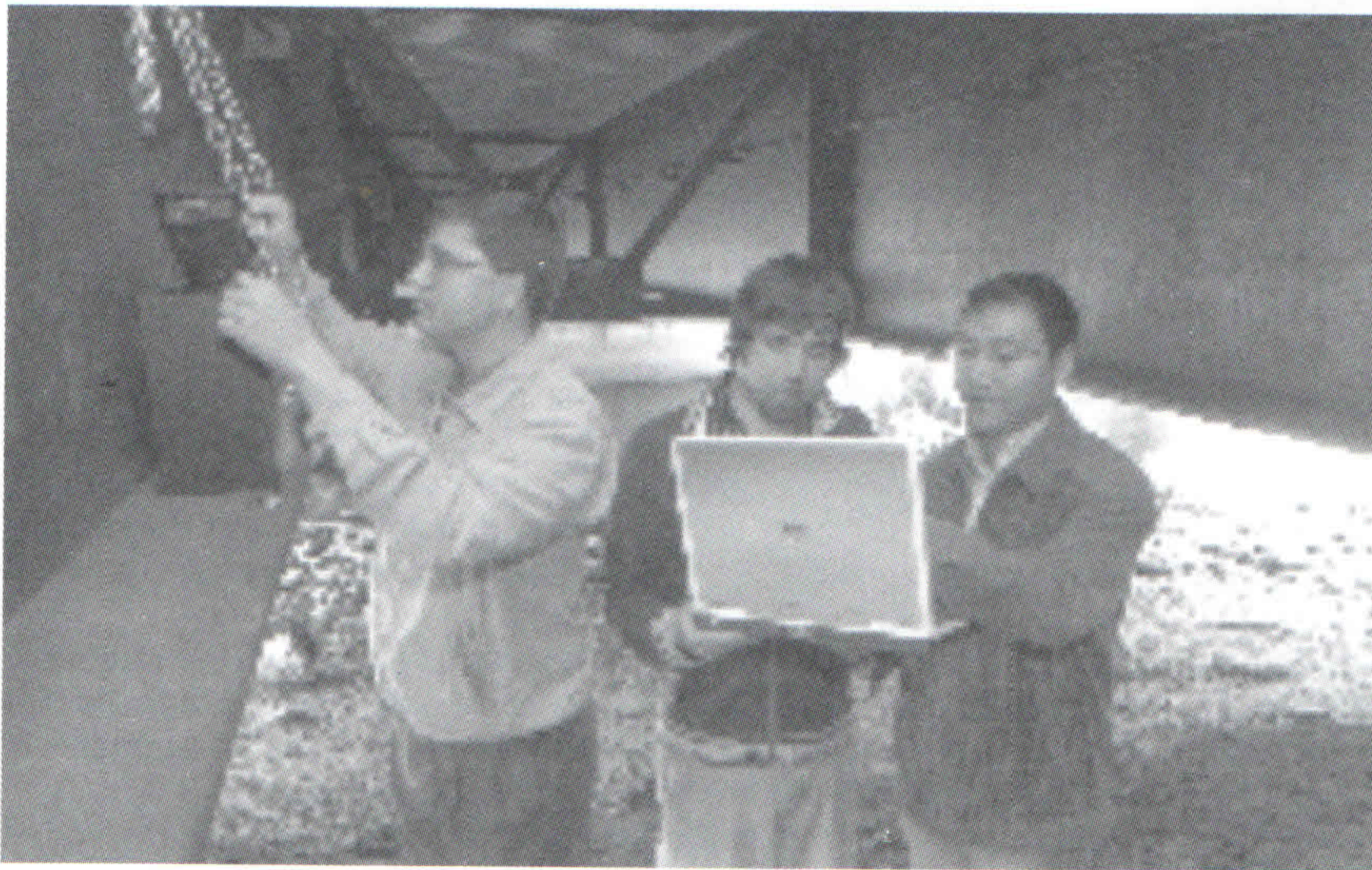
Sustainability is most commonly defined as The ability to meet the needs of the present without compromising the ability of future generations to meet their own needs. Unless this goal is applied to everyone, it's impossible for us to have a sustainable global society. Sustainability is about humanity as much as it is about greenery. Living walls are lovely, but they're not a free ticket to environmental integrity



## New Wireless Bridge Sensors

powered by Passing traffic

Courtesy: Clarkson University



### “ Clarkson University ”

*Researchers have developed technology that uses the vibrations caused by passing traffic to power wireless bridge monitoring sensors.*

**'Wireless battery-powered sensors'** that monitor bridges and report changes that may lead to failure, are easy to install but it is unmanageable to provide power for the sensors.

Each bridge needs at least several sensors, many installed in hard-to-access locations. Replacing millions of batteries could become a problem, adding to the expense of maintaining the bridges. The Clarkson researchers have found a way around this problem.

***"We have completely eliminated the battery from the equation,"***

*says Assistant Professor Edward S. Sazonov, who developed the technology along with Professor Pragasen Pillay.*

**"Hermetically sealed wireless sensors** powered by bridge vibration can remain on the bridge without need of maintenance for decades, providing continuous monitoring of such parameters as ice conditions, traffic flows and health status."

The two electrical and computer engineering professors, along with graduate students Darrell Curry and Haodong Li, used the New York State Route 11 bridge, a steel girder structure, which runs over the Raquette River in Potsdam, N.Y., as a case study. Energy was harvested by locating an electromagnetic generator on a girder. The harvester responded to one of the natural vibration frequencies of the bridge. Each time a car or a truck passed over the bridge, even in a different lane from the sensor installation, the whole structure vibrated and excited the mover in the generator, producing electrical energy.

Harvested electrical energy powered unique wireless sensors that increased energy output of the harvester and consumed only microwatts of power while performing useful tasks. Sazonov and Pillay are also working on using the energy harvesting technology to power the various sensors in passenger cars.

Wireless monitoring of bridges and overpasses has gained much attention in the past few years. Bridge collapses happen suddenly and unpredictably, often leading to tragic loss of human life. Currently, bridge monitoring is performed through periodic visual inspections. In the tragic example of I-35W Mississippi River bridge collapse, the bridge passed a visual inspection a year prior to failure. Thanks to professors like Sazonov and Pillay that we will be seeing the advancements in technology which will help us build more secure and safer infrastructure.

For more information contact Michael P. Griffin at [mgriffin@clarkson.edu](mailto:mgriffin@clarkson.edu)



## Nirman Exhibition 2007

### Exhibition Nirman 2007

Like every year our institute organised our annual mega event "Exhibition Nirman 2007" this year also, under the guidance of Exhibition Committee and President & Hon. Secretary of the Institute. Like last year this time also the exhibition was held at Ahmedabad Education Society, Ground, Drive In Road, Ahmedabad between 19<sup>th</sup> to 22<sup>nd</sup> December 2007.

This year 60 stalls were erected under 3 domes with all required facilities. This year special arrangements were made to promote Architects & other professionals by offering them "Gallery's" at Free of cost.

Due to the efforts of Office Bearers, Managing Committee members and other members all the stalls were occupied inspite of very short time available. Stalls were taken by Banks, Cement Company's, Software Company's, Insulation Company's, Plastics and Electrical House wares. Image and Artifacts Company's, Surveying Instruments Pipes, Mattresses Construction Chemicals and Manufacturers of various and varied other products.

M/s. Adani Township and Real Estate Co. (Shantigram township) were the main and Title Sponsors, Siddharth Tiles (Jalaram Ceramics Ltd.) were the Co-Sponsors whereas Devnandan Builders Pvt. Ltd., Dev Group and Kunj Infrastructures Ltd. were the dome sponsors.

The Inauguration of the exhibition was done at the hand of our Chief Guest Shri Surendrabhai Patel, Rajya Sabha M. P. and senior and most respected member of our institute. Guest of Honour was Shri Vasantbhai Adani of Adani Group. While they were lighting the lamp flower petals were disbursed on them from Miniature /Model Helicopter.

This was an unique experiment. Thereafter both dignitaries along with Office Bearers and Committee Members went through the exhibition and visited the stalls. They took deep interest in the products exhibited and enquired and discussed with stall holders about their wares.

A Food Court had also been setup to meet the food requirements of stall holders and general public. Free Tea, Coffee, Water and Dinner arrangements were made for the benefit of the stall holders. Promoters (Young Boys and Girls) were arranges who looked after the needs and help of stall holders.

Regular arrangements were also made to apprise the stall holders, and public about various noteworthy matters through public address systems. Imported and chemical toilets were setup for the convenience of stall holders and general public.

A special office was setup and staffed to meet requirements and help of stall holders. Everyday large crowd visited the exhibition and appreciated the same. An estimated 1,00,000 footfalls were registered.

Everyday at night cultural show were organised for members of the institute & stall holders. The programmes consisted of Music Shows, Theme Fashion Show, Modern Dances with product launching and Gujarati Gazals. All the programmes were attended by large number of members who enjoyed the programmes. Last day a valedictory programme was held Shri Vimalbhai Ambani was the Chief Guest.

He and President of institute Shri Bharat Patel spoke on the occasion. Our senior member Shri J. P. Desai was felicitated for his services to the institute. Thereafter all the member who had helped to make this exhibition successful were felicitated with a Trophy.

All the stall holder were individually invited to the stage and honoured with a memento. Lastly, Shri Vatsal Patel, Hon. Secretary gave Vote of Thanks to all.

This was one of the most successful event organised by the institute this year.



### Congratulations



Dr. Rupesh Vasani FLM - 725. has been granted a patene on "A Novel Bottle Dripper For Drip Irrigation system" by the patent office Govt. of india



Our member Shri Yogesh Shah FLM - 440 became the first Indian to bag the Asian open tennis championship (above 50 years) singles title in Bangalore.





# Glimpses of Nirman Exhibition 2007



ESTD. : 1947

60 glorious years  
1947-2007

