

Iconic Structure

THE CAPITAL, MUMBAI



engineering that created high quality and geometric sophistication

In modern times come modern needs and for one of the fastest growing economies in the world, a structure that is bold, innovative and peculiar is deeply desired. This requirement is fulfilled by a 21st century edifice that goes beyond a conventional construction in the name of The Capital. This magnificent commercial building makes a statement that it is part of a future that is strong, progressive and liberal. Located at the heart of BKC, Mumbai's new

financial nerve centre, 'The Capital' is an iconic development that will be the pride of India's commercial capital and envy for the rest. This cutting edge edifice showcases an everlasting and contemporary façade, while its interiors feature a rich palette of colours and textures.

Capitalizing the Location

Over the past decade, Bandra Kurla Complex (BKC) has become Mumbai's new

financial nerve centre with major corporations like NABARD, IL&FS, Asian Heart Institute, ICICI Bank and Citibank all setting up their main bases here. Established by Mumbai Metropolitan Region Development Authority with the intent of making this once marshy land a commercial hub, BKC has been able to achieve superior infrastructure and improved connectivity compared to other micro markets. Another big factor which has seen BKC gain



VIJAY WADHWA, *Chairman*, The Wadhwa Group

“ Every business hub that The Wadhwa Group has ever constructed has been way ahead of its time. In that sense, 'The Capital' is no different. This project is a commercial building like no other in India; and iconic in this true sense. For many, it is likely to represent India's arrival into the developed world. Building this project could only be possible by partnering with the best international experts, in every field of commercial construction

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Developer
The Wadhwa Group

Architect
**James Law
Cybertecture**

Structural Consultant
**Mahimtura
Consultants Pvt Ltd**

Structural Contractor
**PPSL
(part of Capacit'e Group)**

Steel Tonnage
3000 MT

commercial status has been its location that allows commuters from the western suburbs and Navi Mumbai garner an easy and quicker way to reach their offices.

Seemingly Inspired Concept

The concept was initially inspired by looking at the world in terms of the planet being an ecosystem that allows life to evolve. The concept for this building was rather like planet earth, where a sustainable ecosystem is derived from an integrated and seamless Cybertecture that is evolving to give the building's inhabitants the very best space to work in. The analogy to the form of the building was for the beautiful planet form to land and create a new Cybertecture ecosystem for people who will use this building.

Symbolically Forming the Structure

The form of the architecture is one that symbolizes with optimism about the future and of the 21st Century. The symbolic planet form within the main structure is

stretched to cater for 20 levels of office accommodation. The design is orientated and skewed at an angle to create both, a strong visual language, as well as to alleviate the solar gain of the building. The architecture is sleek and computer designed, with engineering that creates a building of extremely high quality and geometric sophistication. This building will act like a "jewel" for the new Central Business District of Mumbai, and a worthy neighbor to the esteemed neighboring buildings of the district.

This building has less columns allowing for the unfettered use of its floors with infinite flexibility. The skin of the building is also designed to be one of the most innovative uses of glass achieved in an office building.

Structuring the Elements

The building offers premium office premises of international standards with high quality amenities. The Capital building has a Six basement + Ground floor + 20

upper floors. The basements house multi level automated car parks and utility services. The structural system is the reinforced concrete core wall at centre with structural steel composite columns to form a dual system. The building has a unique egg-shaped dia grid structure that gives the building an iconic look. It is one of the few projects in India wherein an Semi up down construction technique was adopted to save on project time, thus, facilitating substructure and superstructure construction simultaneously.

Steeling the Structural Show

The approximate structural steel consumed on the project was to the tune of approximately 3000 MT. At 'The Capital', structural steel is used for all structural elements and at almost all the levels as an equivalent RCC design was becoming too heavy, unmanageable the use of structural steel was only the option. Steel composite columns were used to reduce column sizes, thereby, increasing the carpet area, even

RAHUL KATYAL, *Managing Director*, Capacit'e Infraprojects Pvt Ltd

“ Execution of 'The Capital' building was a new feather in our cap. Although, we had successfully executed some of the complex structures involving structural steel in the past as well, but, this project in particular, tested and proved our capacity as one of the competent steel fabricators in our country. First of all, the design is truly outstanding, and to make this design a reality, does need a lot of precision, and it was an accomplishment of sorts

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though the spans were large and it was a requirement to have large office spaces without any obstruction or hindrance.

A self shuttering system in form of steel decking was resorted to for an up-down construction at ground level which helped it to be designed as a composite decking system. The transfer girders in the structure are in steel to reduce the height of the beam at various levels. The main transfer girder at entrance foyer level, though designed as post tensioned beams, could be constructed only by using steel shear plates since the shear was tremendous.

The dia grid was in steel pipe section which had to be completed in order to rest the post tensioned floor slab on the dia grid beams, seen on the façade. A three dimensional oval structural steel skeleton hollow circular pipes 320 mm dia intermediate and 850 x 850 square outer peripheral ring using 60 mm thick steel plates forms the dia-grid within the ring spanning 78 m.

It was a design requirement to close the ring beams first and then proceed further to higher levels. Once the ring beam was

complete, only then the above levels could continue. To relieve the loads coming on the ring beam, deep bracket beams have been introduced to carry the upper floor load and transfer the load to the columns on the inner grid.

Greening with Glory

The Capital is an extremely eco-friendly building. From its cooling devices, to its plumbing, to its brilliant utilization of natural light, it is tremendously energy-efficient. Every feature and function is based upon enhancement and performance-driven design which benefits both the occupiers and environment through minimal carbon footprint. The building's architectural features ensure that it does not contribute to any increase in the ambient temperatures, has no significant impact on the wind-flow of the surroundings, and does not cast a shadow on the adjacent grounds or other eco-sensitive areas during any time of the year.

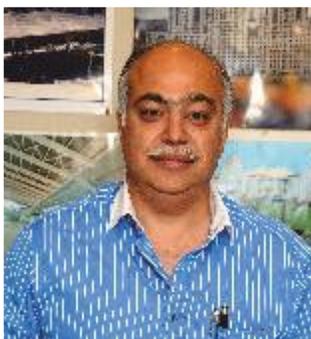
The building's design results in a 35 per cent increased energy-efficiency over conventional buildings. The Capital's architectural positioning and low solar co-

Salient Features

- Composite structure (Structural steel + RCC)
- 6-tier parking in basement with 10 nos. of car lift + 20 floors above ground level
- Post-tensioned slabs from 5th floor & above dia grid
- Total built up area of 1,16,652 sq mtrs
- Building height of 78.14 m above ground level
- Basement area of 5420 sq mtrs in plan
- Basement depth of 11.36 meters below ground level
- Highest grade of concrete used M-65
- Special concrete: Self compacting concrete of grade M-65
- Largest concrete pour of 1500 cum RCC Slab
- Structural concrete used is 50,000 cum
- Structural steel used is approx. 3000 MT
- Steel reinforcement is 8,250 MT
- Formwork is upto 1,42,733 sq mtrs

efficient double-glazed glass exterior ensures that it gets adequate daylight of 79.2 per cent for regular occupied spaces. The building is fitted with LED lights everywhere, to keep power-consumption to a minimum. The quality of the air in the building is 30 per cent higher than the requirements specified by ASHRAE 62.1.

With water-efficient fixtures, a sewage treatment plant, and a rain-water harvesting system, The Capital is a "Zero Discharge" building. The building meets all 'Gold LEED' specifications and will soon be applying for the Gold LEED Certification for its core and shell. All the office units have double-glazed glass, which itself targets an 18 per cent saving of energy. In the Sewage



HITEN MAHIMTURA, Director, Mahimtura Consultants Pvt Ltd

“ This building has a lot of structural challenges which we could overcome because of the flexibility and high tensile stress plates available for design. We used a combination of high tensile sections, plate girders, pipe sections and composite decks in order to capture the architectural intent

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Treatment Plant (STP), the water is used for chiller management and other systems. The building also has a rain-water harvesting system that is one-of-a-kind in India. The landscaped garden is also looked after with recycled water.

Additional Details

Sizes: 72000 Sq Ft, 36000 Sq Ft, 4500 Sq Ft

Amenities:

- CCTV/Intercom
- Centrally AC
- Conference Room
- Club House
- Fire Alarm
- Reserved Parking
- Visitor Parking
- Visitor Waiting Area
- Gym
- Lifts

Deservedly Awarding

The Capital was Awarded Commercial Project of the year at the 27th National Real Estate Awards. It is ultimate project for any commercial space of international standards. Its large floor plates of 50,000 square feet, composite steel column, world' largest automated car parking system, Gold

LEED certified building, 100 per cent power back-up which factored the teams to get feted by numerous awards.

Rahul Katyal, Shailesh Mahimtura, Khurshed Daruwala also received an award from the developer, The Wadhwa Group, as a token of appreciation for completing the project on time and with perfection. Rahul Katyal on behalf of PPSL (Capacit'e Infraprojects) and Shailesh Mahimtura on behalf of Mahimtura Consultants received their respective awards during the felicitation.

The Capital is an architectural marvel and is likely to be most coveted of all commercial properties in Mumbai. It has cutting-edge systems and facilities like automated parking; stunningly designed grand-arrival lobby; sky lobby with café; bars; gymnasium; a high-end restaurant and affordable restaurants; intelligent elevator-system; state-of-the-art security surveillance; intelligent integrated building management system and so on. It is an ultimate enriched work environment and its design is guaranteed to reduce life-cycle costs and improve staff productivity.



Rahul Katyal receiving award from Sanjay Chabria, MD, The Wadhwa Group



Shailesh Mahimtura receiving award from Sanjay Chabria



Khurshed Daruwala being appreciated by Sanjay Chabria



AJAY KULKARNI, Director, Pratibha Pipes & Structural Limited

“ The structural box columns of the building were fabricated at our fabrication plant in Wada which is operated by sophisticated CNC machines. Software was extensively used in the production, so that the accuracy and correctness of the fabricated structures were maintained. This avoided the manual interference and made the production process completely automated ”

