

STERLING

ENGINEERING CONSULTANCY SERVICES PRIVATE LIMITED



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Mill Lands of Mumbai



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Editorial *Dr. Deepali Hadker*

From Cotton Mills of Bombay to Luxury Towers of Mumbai

It gives me great pleasure to bring to you the 12th issue of our Newsletter – this time, dedicated to the “**Mill Lands of Mumbai**”. As a consulting engineering practice which has designed several landmark projects in the city, we have been closely associated with many of the structures on former mill lands that have changed the skyline of the city in the past three decades. For many of our young readers, it will be interesting to know that in the first half of the 19th century, India exported cotton to Britain, and then imported the textile. Bombay was often referred to as the "Manchester of the East". The impetus towards the founding of a cotton industry came from Indian entrepreneurs. The first Indian cotton mill, "The Bombay Spinning Mill", was opened in 1854 by Cowasji Nanabhai Davar. Opposition from the Lancashire mill owners was eventually offset by the support of the British manufacturers of textile machinery.

The cotton mills were owned and managed mainly by Indians. The initial investments came from families of the mill-owners, mainly obtained from trading. By 1870, there were only 13 mills in Bombay but as cotton exports grew during the American Civil War, when supplies from American cotton plantations were interrupted, the number of mills in Bombay too increased to 70 mills and by 1915, there were 83 mills. A period of stagnation set in during the recession of the 1920s. In 1925, there were 81 mills in the city. After World War II, under strong competition from Japan, the mills declined. In 1953, there remained only 53 active mills in the city. However, with the development of newer industries in and around Mumbai, these mills ceased to be profitable, and fell into a state of disrepair.

As they say, change is the only constant. Soon these large mill lands were quickly bought by high profile developers as the Government relaxed its norms that once restricted the redevelopment of mill lands. Between 1990 and 2010, as part of the wider modernization of Mumbai, these mill lands were acquired and developed to make way for new residential and commercial buildings.

Featured in this newsletter are more than a dozen mill-land projects where Sterling was appointed to plan and design several high-end residential, commercial and mixed use developments which have completely changed the fabric and landscape of this city where textile mills once stood.

Enjoy the issue!

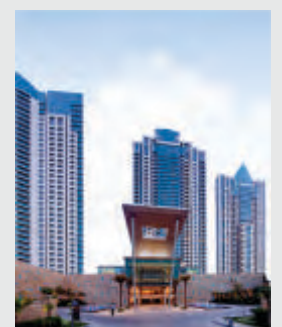
Simplex Mills - Planet Godrej, Mahalaxmi

As you approach south Mumbai on any of the main arterial roads, a fabulous wall like building looms large on the skyline. This 48 storey wonder is a marvellous structural engineering feat which can be seen through its slender form and its gentle curvature which lends it the stability it requires against wind and earthquake. This 168.5 mt. tower is composed of a series of 5 high end residential buildings which are 28 meters x 11 meters each in plan. The floor to floor height is 3.2 meters. The complex has a podium with club house, high speed lifts and common amenities. Concrete grades used in this building were M: 60, 50 and 40.



Standard Mills - Beau Monde, Prabhadevi

The up-scale residential complex ‘Beaumonde’ was developed by Sheth Developers and was their first venture into luxury living spaces. This complex won several accolades on all fronts of development including the Ace Tech 2010 Real Estate Awards for Excellence in Exterior Architectural Design & Excellence in Interior Design in India, the Cityscape Awards Real Estate for Best Developer Residential (Built) in Asia, the Asia Pacific Residential Property Awards for Best High-Rise Architecture in India and the Asia Pacific Property Awards for Best High-Rise Development in India.



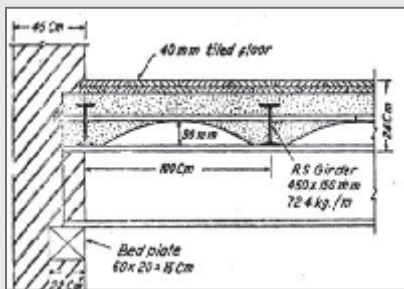
IMPRESSIONS *Girish David*

By the 1990s, most of the textile mills in Mumbai had stopped textile production. Some mill owners obtained special permissions to use the sheds and buildings for activities other than textile processing and production under stringent conditions. During this time, I had a few opportunities to wander about the ramparts of the mill structures. I had never been in a textile mill in running condition all my life till then. But now, I could visualise the process driven layouts of various buildings, sheds, manufacturing halls, de-humidifying chambers and ducts, ware houses, boiler houses and many other functional constructions in the sprawling compounds - although all the life was taken out of them. This opportunity was in a way very rare. Imagine a time period of only about 130 years, amidst the history of millions of years of human existence, during which textile manufacturing flourished in India from 1850 to 1980, created an industrial cult in India, feeding millions of workers, generating national wealth of unimaginable values and gave Mumbai its unique identity along with a sensational new street food dish - Pav Bhaji.



And then this magnificent empire died a slow death. The structures that were constructed specifically to facilitate textile production, were no longer relevant. They were about to vanish from the face of the earth. And here we were, looking at bare structures towards the very end of their existence, at their aesthetics, functionality, grandeur and above all, feeling that poise of the space, which had seen generations using itself over more than a century, leaving ample marks of lovable caresses, names engraved, pictures of deities hung about, occasional sights of oily uniforms, gloves and caps tucked in unlocked locker rooms, tiffin boxes and so many more of these remnants

In all the mill premises that I visited and surveyed to put a final stamp of their irrelevance in the post-textile prominence period, there were threads of common structural concepts. Presence of cast iron columns of 6 to 8 inches diameter, sometimes tapered, with manufacturer's names (often from England or Ireland) and year of manufacturing engraved, with flared column heads to receive steel beams - were noticed predominantly in the process buildings. These buildings had usually three to four stories with about 5 to 6 m floor height. Structural engineer geeks, who immediately start wondering about lateral stability of the buildings with such slender columns, could have found comfort in the 5 to 8 feet thick masonry walls at the gable ends, which served as shear walls, and the elevation walls on longitudinal sides having a thickness of about 2 feet, which provided similar action in the other direction. After about 40 to 50 m, the building was structurally terminated, and a new building was constructed after a gap of about 10 ft, with similar configuration. There were staircase blocks and lift shafts, which acted as buttresses to the buildings. The gaps between the buildings were used as passages to cross the process buildings to enter utility areas such as boiler houses, pump rooms, electrical rooms etc, which were located behind



the process buildings, but before huge water storage tanks. On both sides of the utilities, towards each end of the process buildings were the sprawling sheds for raw material, colouring and dyeing units and rolls, folds and bales of finished cloth.

The floor of the processing building was invariably a jack arch floor. The arch material varied from corrugated GI sheets, pre-cast concrete cylindrical shells or sometimes even bricks. A concrete or lime filling on top of the shell gave the arch sufficient compressive strength to bear the imposed load from the heavy machinery. The load was transferred to the secondary beams embedded within the floor. The main beams,

picked up the point loads from the secondary beams, then threw the reactions on to a bedding block within the perimeter masonry walls.



During one of the surveys, in order to ensure that the foundation could take the load arising of new use of the building as a retail mall, we excavated around the footing of a cast iron column. The footing consisted of a square brick pedestal, increasing in size by two feet for every six feet depth. The brick pedestal continued in such a fashion for 30 ft depth !

Many of the mills were located in the creeks separating the seven islands of Mumbai. Enormous landfills of great depths were encountered when the excavations for basements were witnessed during later stages. Huge water tanks, ventilation shafts, humidifying chambers, pipelines, cable trenches and many other services were laid underground, and even under various buildings and sheds of the mills.

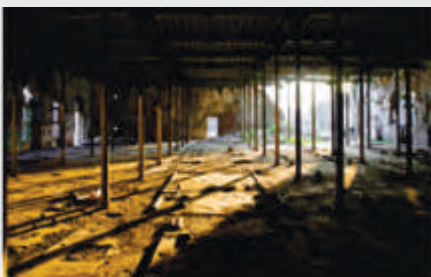
Almost all door and window openings in the masonry structures were crowned by an arch. This practice imparted a characteristic elegant style to these factory buildings and brought a sense of grandeur. These windows on the longitudinal peripheral walls were large enough to provide daylight across the entire width of the process floors, which could be even 100 ft from wall to wall.

The roofs of the Ground + three storey process houses had either steel or wooden trusses resting on the cast iron columns, tied with steel beams. Over the years, the roofing material needed to be changed, and many variants of the roofing material could be seen co-existing over the purlins.



Every mill had a boiler house and an associated chimney. These chimneys were constructed in brick and plastered from outside. There was a fire brick lining from inside with rungs fixed to climb the height of the chimney. Standing tall amidst other low rise structures in the then textile mill zone of Mumbai from Byculla to Matunga, these chimneys sported the names of the mills they belonged to. One could almost easily navigate through the maze of Girgaon lanes by keeping a chimney in sight.

Over the decades, many structural systems were tampered with, probably to accommodate accessories of replaced machinery, improvement in services, repairs of damaged portions and additions of mezzanines, lofts, lifts and staircases. If one would have catalogued the nature of repairs, it could have been possible to recognize the way things were repaired with successively different methodologies prevalent in the corresponding periods.



When I walked around the dilapidated unused interiors of the decaying structures during the final structural surveys, it was a feeling of nostalgia of a time that would never return. As I glanced at the various shapes of trusses, windows and other nameless elements silhouetted against the rays of filtered sunlight in the backdrop, breathing in the moist grime on the floors and walls, smelling the red and yellow rust on the columns, trusses and all those retired machines waiting to be transported to a junkyard, it was an overwhelming sense of privilege. To have witnessed buildings, structures and spaces that had made such a gigantic impact on many generations of

people but were now fated to cross over into oblivion, never to be brought back to life was like a dream that occurs just before one wakes up. It fades away far too soon, without a definite story but with a memory of faint visions and impressions.

China Mills - Dosti Flamingo, Sewri *Pramod Saharabudhe*

One of the problems at China Mill compound was an existing tall chimney made up of brick work which was more than a 100 years old. We wanted to keep this chimney as a remembrance of the yesteryear's era. Ascertaining structural stability of the chimney was one of the important task. The chimney had survived for 100 years but was it safe for wind and earthquake? In order to ascertain this, a detailed survey of chimney was undertaken along with thicknesses of brickwork at various levels. This was then carefully analyzed for wind and earthquake conditions. The old design was found to be quite satisfactory. There were doubts about deterioration of material. In order to protect and strengthen a structural outer layer was created. This was made with a new finish recommended by architect. Today the chimney is standing tall along with the towers.



Shreeram Mills - Palais Royale, Worli *Girish David*



In the upmarket Worli area of the fast changing Mumbai City, a gigantic form overwhelms all other buildings in the surrounding. Presently having completed the terrace level structural construction in the erstwhile Shreeram Mills Compound, the residential building still under the green garbs of protective nets is meant to be a very high end property product, and has been a point of discussion among professionals, investors, property dealers and construction industry watchers. Last some years have seen a complete transformation of this part of the city, what was once the district of many textile mills and residential colonies of thousands of textile mill workers, into a swanky residential, commercial and retail zone, on the same mill lands and attracting huge investments in real estate.

Property prices in this area are among the highest in Mumbai, comparable to downtown Nariman Point and Colaba. Located at the junction of six major roads, very close to the famous Mahalaxmi Racecourse, Nehru Planetarium, Nehru Science Centre, a four hundred old mosque, an ancient Mahalaxmi Temple, couple of education institutes, TV Centre and headquarters of some major business houses, christened as Palais Royale, developed by Owner / Promoter Mr. Vikas Kasliwal, this building is set to raise the standards to a new high in luxuries and amenities with many firsts to its credit.

The building with a height of 320 m above the ground level has a total structural height of 350 m from the bottom of the foundation to the top of the elevation cap. The base dimensions of the octagonal prismatic building are 84m x 86 m and continue to the top with minor variations built in the façade projections. The total construction area of the building is pegged at over 3.3 million sq.ft., which could be a record in itself for one single building in Mumbai.

This mammoth of the building with its grand scale, is an overshadowing monument of Central Mumbai, dwarfing all surrounding structures which are built with characteristic slenderness commonly desired in skyscrapers. Currently, this is one of the tallest residential buildings under construction in India. The very first newsletter covers all aspects of the building including the adventurous thrust provided by us to push the frontier of the construction technology.

Swan Mills - Peninsula Technopark, Kurla *Manish Negandhi*

As the mill lands were opened up for development, there was a scurry to grab the mill lands and keep on adding the land banks. Primarily, all the Mill lands were in the heart of the city which meant that their development of them would yield high commercially. To capitalize on the same Peninsula Land Limited had picked up the defunct SWAN MILLS LIMITED having there mills at Kurla and Sewree.

The property in Kurla being on the L B S Road & at the start of the fast developing commercial hub Bandra-Kurla Complex was planned to be developed for Commercial purpose. Approximately 9 L sq. ft. built up area was developed. Due to the proximity of the site to Mumbai airport, the vertical growth of the buildings was restricted. The parcel of the land is subdivided by a small lane which splits the property in two parcels. Four buildings were planned in the complex. Three of them were planned in the parcel of land abutting the main road. The rear parcel having less main road frontage was very efficiently used to comply with the development rules of handing over the part portion to BMC and for creation of RG. The balance land was used to accommodate one building. The plan of merging the two plots has been approved by constructing & handing a much wider road to the corporation. Each building has seven floors with a common basement to cater to the parking needs and to house the services.

The space between the buildings is used for landscaped garden. A small clubhouse along with a coffee shop is also planned in the (entire) complex. The structural system for all the buildings is flat slab with a drop panel except for building D in the rear side which has a banded flat slab on account of larger spans in one direction.



Hindoostan Mills - Viverea, Mahalaxmi *Dinesh Bhaud*

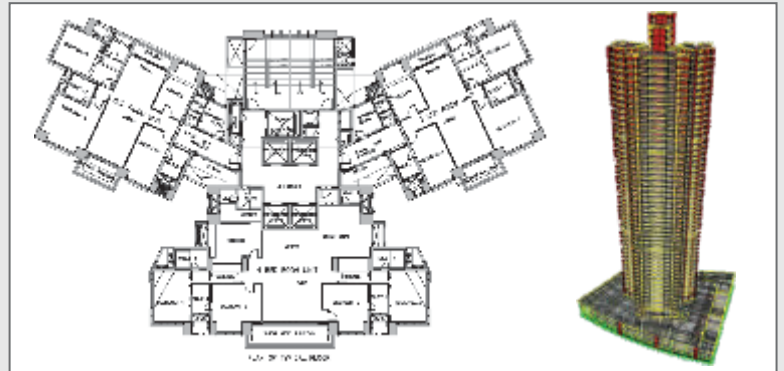


These magnificent towers strike a stunning pose between Mahalaxmi racecourse and Bombay dockyard (two of the most prestigious locations in Mumbai) for a sublime and vintage perspective view. This residential complex of five towers is located at Jacob Circle and is complimented by their pristine "Y" shape tower structure in plan view. Out of the five towers, three towers have already been constructed and have been designed by our fort office. The remaining two towers are being designed by us which are currently under construction.

These towers are 192.5mts tall above ground level. The dimensions of the tower above podium are 52.02 m x 33.54 m, which remain constant throughout its height. The towers, which are currently under construction, consist of 2 basements, 2 stilt floors, and a podium level. Above podium level comprises of 34 residential floors, 7 refuge floors and a terrace floor. Building is having 3 flats per floor with a central core for staircase and lift lobby. The podium structure around the tower rises to about 8.55 m above the ground level. The massing of apartments begins from 16.45 m above ground. Typical

floor to floor height is 3.8 m. There are seven refuge floors and are located after every five floors.

The structure is essentially a R.C.C. structure with shear walls, columns-beams, conventional slab, and flat slab. The columns and shear walls are connected to each other with beams. The foundation system comprises of a stiff raft of 3000 mm thick in order to counter the heavy column and wall loads as well the uplift and overturning forces. Majority of the residential area in the habitable floors have been designed as flat slab in order to facilitate the ducting and ventilation system with ease.



Dawn Mills - Peninsula Business Park, Lower Parel *Manish Negandhi*



Peninsula Land Limited developed the defunct Dawn Mills premises at Lower Parel into a 1.2 million sq ft commercial space. This property had a unique distinction of being at the corner of two main roads with a curved boundary on one side. Also, two bridges ran parallel to two sides of the plot so the commercial floors had to be planned higher than the bridge level. Another dream of the client / architect was to have a 12 m wide driveway at the Bridge level all along the building for Fire tender movement. However, on the front side, supporting columns were not permitted due to Municipal bye-laws. This meant an out of box solution had to be thought of to achieve this. The main plan of the building also underwent a lot of revisions to achieve the full potential of the plot.

Since the entire plot was very wide, it was divided into three parts. Two parts were used for towers and the third part housed the service area and Clubhouse. Each of the two towers has a Basement, Ground Floor, 5 Podium Floors, service floor and 21 Office floors with a 30,000 sq ft floor plate. The entry is through a double height grand entrance foyer. Parking is planned in the basement from P1 to P4 levels. An exclusive Club House is situated above the service wing at P5 level. A large deck is planned at the P5 level. Office floors start from the sixth floor and consist of RCC flat slabs with drop panel arrangement.

A walkway spans the space between two towers and reaches the far end of the cantilevered deck for viewing. The cantilever deck is designed to withstand the loads for 2 fire-tender engines besides other loads. To facilitate better load transfer, inclined struts were introduced from the peripheral columns supporting the cantilever girders. To reduce the cracking effect othe finished floors, the deflections of the girders were kept minimal. Additional walls were introduced to counterbalance the lateral sway of the projections in the service bay at the other end of the building. Horizontal expansion joint between the tower and podium was avoided to have a wider system for efficient force transfer.

Spring Mills - Luxury Tower, Wadala *Kamal Hadker*

This building was the first luxury apartment tower to come up in Wadala. Although the surrounding area primarily consisted of middle income group housing, the owners of Spring Mills, decided to develop this plot as a tall Ground + 38 storey tower comprising of very lavish luxury apartments commanding views in all four directions.

The architectural designs were prepared by D. P. Architects from Singapore. For structural designers the challenge was in designing a 140 m tall building without any symmetrical planning or interconnected shear walls. Most of the lateral loads were resisted by the central core. The building is supported on 2 m thick raft which in turn is supported on 271 cast-in-situ bored piles. Thus construction could begin without waiting for the finalization of exact centreline plans.

The raft area was about 1375 sq mt and concrete volume was 2750 c.m. The raft was cast in 5 pours of approximate 550 c.m. each. Specifications for hot weather / mass concreting were prepared to control the heat of hydration and shrinkage cracks. This also included using thermo couplers to monitor the concrete temperature for 12 days after concreting and plotting the temperature graphs.

In order to capture maximum views in all directions, internal partition walls were used as load bearing shear walls. The typical floors were designed as 200 mm thick flat slabs to permit complete flexibility of planning for the end users. Bathroom areas were sunk by 50 mm only to accommodate waterproofing treatment. However, the soffit of the slab remained at one level. Thus, the interior designers were not restricted by internal beams, or sunken slab soffits. Another unique feature in this building was the large cantilevered deck slab. This slab was 375 mm lower than the typical floor level leading to complicated detailing of reinforcement along the peripheral beams. The top few floors were designed as special pent houses having private internal staircases. The final terrace slab was also designed for heavy landscaping loads.



Swan Mills - Ashoka Gardens, Upper Parel *S. B. Malekar*



Spread over 12 acres of land, this luxurious residential complex stands tall in the largely industrial belt of Parel. Developed by Piramal Holdings Ltd, this residential scheme has 2 towers, 23 storey high with 3 wings each. The three wings of each tower have been structurally isolated by separation joints. There are eight ramps to reach the podium level. The residential levels have spectacular views of the harbor. The challenge was not only to design the multi-storied towers but also the surrounding ancillary buildings with modern amenities, clubhouse, landscaped areas, water features and car parking for its residents. In addition to this, the complex has a sewage treatment plant and an elegant swimming

pool. The structural drawings prepared for this project had to be carefully co-ordinate d not only with the MEP service but also with BSES as two large sub-stations were required.

Jupiter Mills - One India Bulls Centre, Elphinstone *Girish David*

Built in the Jupiter Mills compound, this enormous building is characterized by an inclined frame of 80 meters height in the front wing. In the rear wing, there is a bridge structure connecting the two buildings at a height of 60 meters. The front facade of the bridging structure acts like a four floor deep Vierendeel Girder. Designed by Ar. Hafeez Contractor, Tower One has 18 storeys and Tower Two has 20 storeys comprising of two wings with corporate offices.

The landscaped podium has two basements. Car parking for 3500 cars is provided in the basements and ground floors.



Morarjee Gokuldas Mills - Peninsula Corporate Park, Lower Parel *S. B. Malekar*

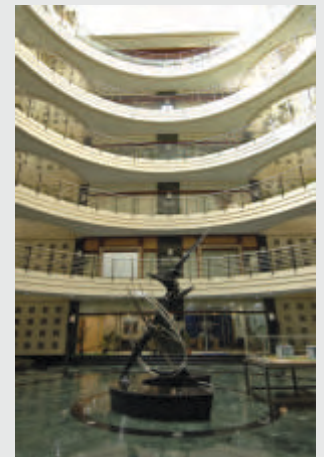
This was one of the earliest mill land projects completed by Sterling. The brief was to design five high quality office buildings in an exceptionally well-landscaped setting, to house the best corporate offices for the country.

Integral to the project was a wide linear avenue starting from the entrance and traversing through the entire site. This avenue offered an opportunity to create a range of primary, secondary and tertiary spaces within the complex. Along this central avenue with its circular roundabout setting, were placed the three main office buildings. Two identical 11-storeyed buildings were placed on either side in a staggered manner. The third building of 7-storeys was placed at the end of this planning axis, with a garden in its foreground to provide a visual depth. The fourth building was an existing building, retained and re-adapted for commercial use.

A recreation club building was designed to provide various interactive and recreational amenities. Additionally, architectural features and elements such as ramps, canopies and graduated grid patterned pavements complemented with lush landscaping helped create a pleasant work environment.

One of the most unique features is the basement car parking facility for over 1300 cars. The office building is square in plan with a symmetrical arrangement of offices, utilities and circulation cores planned around an internal atrium. This efficient floor plate design allowed for uninterrupted office space with only peripheral columns and the flexibility of dividing the plan into four quarters.

Within the building is inlaid an elegant square atrium covered with openable glass roof. A system of cantilevered circular horizontal walkways joins all the areas to the appropriate collection staircases.



Mafatlal Mills No. 3 - Marathon Futurex, Lower Parel *Arvind Kanaujiya*



Located in the Mafatlal Mills compound on N.M. Joshi Marg, just a minute away from Lower Parel station and Curry Road station, this Gold Rated Green Building project is developed by Marathon Realty. Planned as an IT and Financial business centre, it will be the tallest commercial property in India with a height of 171.45 M. The plot area is about 74,000 sq ft. There are three basements and we can see two towers rising up to the 14th floor of which one tower continues till the 37th floor.

Since the property was adjacent to the railway compound wall, shoring for this building was much more complicated. 900mm dia shore piles have been used for this project. The tower is designed as a RCC structure with shear walls, peripheral columns connected with RCC beams, P.T flat slab with drop panel at basement parking floors, P.T Rib beams and P.T slabs at upper podium floor and Deck slab at typical floor level. The Clients required large floor plates of 30,000 sq to 65,000 sq ft. To accommodate up to 800 workstations per floor! Structurally we had to design large spans of up to 15.5m to give grand column free spaces. Floor to floor height is 4.2M. Another challenge was to design the inclined column from the

23rd floor to the 28th floor. Large landscaped spaces are provided to ensure a close association with nature while the employees work with new age technology. Over 15 sky gardens staggered along with the two vertical form of mini ecosystems are planned in this vertical city. A large garden with swimming pool and club house is also provided at the 8th floor level.

Mumbai Textile Mills - The Park, Worli *Amit Suralekar*



“The Park” is defined by its piece-de-resistance meaning “masterpiece”: a 7-acre private park surrounded by modern luxury residential towers, located in the heart of city, luxury neighbourhood at Worli, Mumbai's lifestyle district. This development has been planned in a 17-acre Mumbai Textile Mills land, which has changed hands from NTC to DLF and then from DLF to Lodhas.

The project consists of six tall slender towers rising upto a massive height of 267 meters, surrounded by a parking structure seven levels above ground level. The entire plot is covered by 4 basements below ground, leaving only a small setback space from compound as per norms. The podium top is covered by lush green contoured landscape. To extract maximum usable floor space for residence, taking benefit of new municipal regulations, six levels of parking will be handed over to Government 5 of the levels for LMV's and 1 level for Bus Parking. G + 4 storied 12 Townhouse structures, 50,000 sq.ft. of multi-functional clubhouse & tree house structure is floated on top of this podium at 80ft level. Some part of the plot is reserved for exclusive international standard, high end bungalows.

The tower design philosophy has been grouped with set of three twin towers. One set of twin towers have rectangular footprint with pagoda like elevation features contrasting to other two which have triangular footprint yet uniquely represented by their facade designs. One of tower is branded with world renowned name of “Trump”.

The main lateral structural system of towers is derived from the strong ductile shear walls placed strategically around lift banks at C.G. of tower footprint surrounded with gravity walls on periphery. The internal shear core is connected to gravity walls with semi-rigid RC flat plate diaphragm giving stability to these slender towers.

Gravity walls have been located after meticulous study of apartment plans, parking requirements & grand entrance lobby. For respecting the functional priority along the height, some gravity walls have been supported on transfer girders.

Podium parking structure is essentially governed by gravity loads. Uniformly spaced columns meeting parking requirement support post-tensioned flat slab with few isolated shear walls giving lateral stability to this structure. Due to its large footprint, the structure above ground is divided in blocks by separation joint provided around towers and passing through podium structure.

The entire development is expected to complete by end of 2019 and the magnificent tall towers will stand out among the skyscrapers of Mumbai city.

UPCOMING PROJECTS



**New Great Eastern Cotton Mills
- Residential Building at Byculla**
Vinayak Naik

A residential complex is proposed to be constructed on a plot on which stood the New Great Eastern Cotton Mills touching Dr. Babasaheb Ambedkar Road, Byculla (E) close to Jeejabai Udyan. The dilapidated remnants of the Mill date back to the 1920's. The plot size is about 5 acres and is being developed by Good Time Real Estate Development. A part of the plot is to be handed over to MHADA for providing housing for cotton mill workers and another part is to be handed over to MCGB for a recreation ground. The development shall also have a Public parking lot for HMV's, LCV's and LMV's. The total area of construction is about 18 lakh sq. ft.

The proposed complex comprises of two residential towers (Towers A & B) separated by a parking and amenities structure. The parking structure consists of 3 Basements and 6 podiums for LMV's, LCV' and HMV's partly for PPL and partly for tenants. The Towers have 8 part refuge floors, 3 fire check floors and 2 service floors.

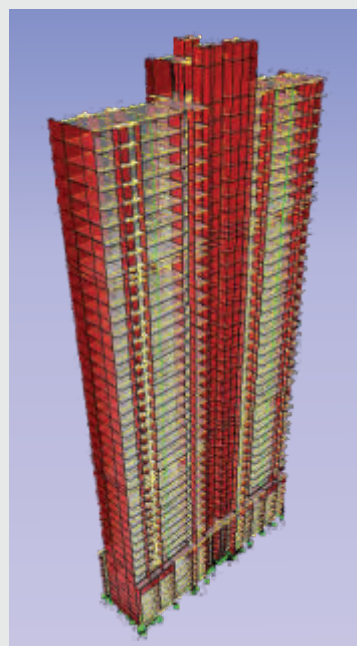
The height of Towers from ground level to roof is 225.4m. The structure comprises of coupled shear walls, beams and slabs. The SBC of founding stratum is 1400 kN/m². The maximum width of Tower A is 27.5m and Tower B is 25m. The aspect ratio of Tower A is 8.2 and Tower B is 9. Despite these high aspect ratios the towers behave satisfactorily for serviceability.

The project is based on a Revit BIM platform for 3D, 4D and 5D modeling. A BIM consultant has been appointed by the client for providing guidance, coordination and charting a structured way forward. This has led to a systematic development of the model where all main consultants for structure, architecture and MEP contribute. All GFC drawings are to be REVIT based.

During an initial site visit Kamal sir talked about an interesting feature common to most large Mill premises which was that all these premises included a large natural water pond with abundant water. This was to guard against emergencies such as fire. This plot also has a large natural pond which remains full throughout the year.



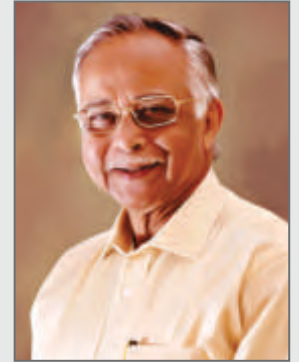
Century Mills
Worli



Modern Mills
Mahalaxmi

Mill Lands of Mumbai - A lost opportunity *Kamal Hadker*

Textile mills have played a very important role in the growth of Mumbai - known as Bombay in those days. Most of these mills were constructed in the 19th century. It is believed that there were about 150 functioning mills located mostly in the central part of the city – stretching from Mazagaon in the South to Wadala in the North. They provided employment to a very large number of workers who had migrated from the neighbouring towns and villages. More than 200 “chawls” were constructed mainly in Parel, Naigaon, Worli and Sewri to provide accommodation for the mill workers. Those who could not afford tram or train fares, chose to live in close proximity of mills in these chawls. The area governed by Bombay Municipal Corporation extended only up to Mahim creek (refer map). Thus a very significant proportion of the city was utilised for the textile industry.



In the early sixties, I had the opportunity to visit some of these functioning mills. The structures within the mill complex were quite fascinating. These structures served the purpose quite well as long as they were properly maintained. However, in the early sixties, with the advent of man-made fibres like Nylon, Terylene etc. the cotton industry started losing its importance and profitability. It was possible to scrap the old outdated machinery and install modern machines to improve production. Majority of the workers were in favour of modernising. However, the mill owners were reluctant to invest in this proposition as they were sceptical about its success. Besides, real estate prices in Bombay shot up dramatically during this period making it easier to make huge profits by simply selling these mill lands to developers.

Major dispute arose between mill owners and mill workers. The Government policy was not clear. Since all these lands had been leased out to mill owners, specifically for running the textile industry, the Government had the powers to review the land use. It was possible to evolve a compromise formula which could have benefitted all. Many learned Town Planners, IAS Officers, Economists and Visionaries like Architect Charles Correa saw this as a golden opportunity to prepare a new master plan for the city of Mumbai. It would provide wider and better roads, several parks and open spaces, separate cycle tracks and pathways for pedestrians. *Imagine riding a bicycle from Dadar East to Girgaum without worrying about vehicular traffic!* It could have given an opportunity to lay new services for water supply, drainage, electrical and telephone networks etc. The funds required for implementation of this plan, could have been generated easily by the sale of residential and commercial properties accessed easily by public and private transport. This would have generated thousands of jobs and tremendously improved the quality of life in Mumbai.



Unfortunately, such reports, master-plans and suggestions did not get any support from the Government. The situation worsened. Each odd-shaped parcel of land was dealt with separately. Some old existing buildings were allowed to be repaired / strengthened and got converted into Commercial premises. Some buildings were declared to be “unsafe” and were allowed to be dismantled completely. By-laws were interpreted by experts to find loop holes to permit construction of modern buildings. It was quite difficult to provide proper access for vehicular traffic and fire engines due to severe space constraints. Each developer tried to maximise the returns on investment. Sadly, the old infrastructure was not improved to cater to this new development.

Today, when we visit these prime areas, we experience chaotic situations due to haphazard and unplanned growth. It must be noted that half of these buildings are still unoccupied and more are under construction !

Now the situation is irreversible. Looking at the manner in which we have “developed” our city, I feel that we have actually lost an excellent opportunity to really turn Mumbai into a “global” city.



Extent of Mill Lands in Mumbai in 1900

Sterling Opens New Branch At Kohinoor Kurla



We are extremely proud to announce the opening of our new branch at Kohinoor Commercial Tower II in Kurla. Sterling moved into these spacious premises in January 2015.

Do visit our new branch office at the address below :
STERLING ENGINEERING CONSULTANCY SERVICES PVT. LTD.
 Kohinoor Commercial Tower II, 6th Floor
 Behind Kohinoor City Mall, Off. L.B.S. Marg, Kurla (West),
 Mumbai - 400 070
 Telephone - (022) 667 44 600 / 01/02/03

Seminars Attended By Sterling Engineers *Shrijay Kalghatgi*

1. On March 20th, 2015 Shrijay and Mohammad attended a One Day **National Technical Seminar on Modern Construction Chemicals and Systems for Construction Industry**, arranged by **IIT Bombay** in association with Chryso India. The main learning was with respect to workability of concrete, pumping and rheology of the concrete during the construction process. A variety of new construction chemicals were showcased and their uses were highlighted for eg. Chryso Quad 20 which is used to maintain workability of the concrete along with cohesiveness. The second part of the workshop was conducted by Dr. Gopal Rai from R & M International, who is an expert in Fibre reinforced polymer composites. He spoke about solutions offered by the use of FRPs on different types of projects. Another aspect of his presentation dealt with Fibre Wrapping used for strengthening flat slabs, girders and columns.
2. On 25th April, 2015, Shrijay, Abhinandan, Nimesh, Muzzafer, Vinod and Dhawal attended a workshop on **Analysis, Design and Construction Aspects of Building with RCC walls (Alluform shuttering)** conducted by **Epicons Friends of Concrete**. The main focus was on buildings with shear walls and its behaviour on lateral loading. Solutions for computer modelling of shear walls with openings as well as spanning on girders were discussed. Detailing of shear walls was also addressed. Information about the use of Alluform shuttering was also given along with its advantage in saving time during construction cycles.
3. A presentation by **Krishna Conchem** was held in our Kurla Office in June. **Dr Kamat** himself presented a variety of special construction chemicals and highlighted their uses in the construction industry.
4. A one day workshop on **Geotechnical Investigations** was attended by our engineer Naman Agrawal, he has to say – “It was a privileged to attend this workshop. along with few of my colleagues, organized by **Indian Geotechnical Society** and **VJTI, Mumbai**. This course contained features and introduction to preliminary methods of soil investigation. Advanced techniques and the impact of soil behaviour on the performance of structure were also covered during the said course. We were enriched with in-depth knowledge and learned a new approach to look at soil mechanics. I would like to thank and present my sincere gratitude on behalf of my colleagues to the Management of Sterling Engineering who offered us an opportunity to attend this course. This motivated us and developed our interest in such technical seminars.”

Photography Exhibition

We were very proud of our engineer from Fort Office, **Nayan Sawant** as four of his photographs were 'Accepted' in the 14th PSI International Print/Digital Salon, 2015 conducted by Photographic Society of India (PSI). Two out of these were exhibited at Jahangir Art Gallery from 3rd to 9th Feb. 2015. The exhibition was inaugurated by Smt. Amruta Devendra Fadanavis (wife of Hon. Chief Minister). The four photos by Nayan have been featured here! Of these 'Framing Walk' and 'Smoke & Sun' were displayed at Jahangir Art Gallery.



Dona Paula



Flipside



Framing walk



Smoke & Sun

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