

Title:	The Remaking of Mumbai: A CTBUH-IIT Collaborative Architectural Design Studio
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Subjects:	Architectural/Design Social Issues Urban Design
Keywords:	Sky Garden Skybridges Social Interaction Urban Design
Publication Date:	2010
Original Publication:	CTBUH Journal, 2010 Issue I
Paper Type:	1. Book chapter/Part chapter 2. Journal paper 3. Conference proceeding 4. Unpublished conference paper 5. Magazine article 6. Unpublished

The Remaking of Mumbai: A CTBUH–IIT collaborative architectural design studio



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Antony Wood

Antony Wood has been Executive Director of the CTBUH since 2006, responsible for the day-to-day running of the Council and steering in conjunction with the Board of Trustees, of which he is an ex-officio member. Prior to this, he was CTBUH Vice-Chairman for Europe and Head of Research.

Based at the Illinois Institute of Technology, Antony is also an Associate Professor in the College of Architecture at IIT, where he convenes various tall building design studios. Prior to joining the Council and IIT, Antony was an Associate Professor / Lecturer in Architecture at the University of Nottingham in the UK from 2001 – 2006, where he ran the third and fifth year programs respectively, and was an active member of various research teams. Whilst at Nottingham, he founded the Tall Buildings Teaching and Research Group. A UK architect by training, Antony's field of specialism is the design, and in particular the sustainable design, of tall buildings.

"The five towers rise up from the urban plane, connected by a sinuous, landscaped bridge that starts at the ground and works its way up, around and between the towers, culminating in a giant urban park in the sky; a horizontal plane connecting the towers and binding the separate schemes and design agendas into one whole."

It had begun in the January of 2009; twelve architecture students from the Illinois Institute of Technology (IIT) and myself as studio professor undertook our first trip to Mumbai at the kind courtesy and sponsorship of CTBUH organizational member the Remaking of Mumbai Federation (RoMF). We were basing our semester's studio project on the very real situation that is the C-ward district of Mumbai. RoMF—a private / community-based organization in Mumbai—had been established in 2006 with the sole aim of improving the urban standards of Mumbai generally, and the C-ward specifically. As they were/are considering tall buildings as a part of the solution, we had together decided to utilize our position straddling the spheres of both industry and academia at CTBUH–IIT by holding an advanced architectural studio for IIT students based on the real project in Mumbai, which RoMF would support.

Figure 1. Showing the final scheme as designed, but only after a long and sometimes difficult pedagogic journey of getting 12 architectural students to transcend architectural ego to work as one.



The 10-day fieldtrip/cultural immersion for the students in Mumbai has already been reported on (see *CTBUH Journal 2009 Issue I*), so the purpose of this article is to pick-up where the fieldtrip report left off; that is, to describe what transpired in design terms once we returned to Chicago, armed with the knowledge of an amazing ten days of study and reflection in Mumbai.

After the past eight years of convening tall building design studios with architecture students, I can say without reservation that this Mumbai studio was the most difficult project we have taken on. To begin with it was a real project, with a real site and a real client who had a level of expectation from our efforts that would give some justification for his financial sponsorship of such bright young minds. On top of that, the setting for the design was that of a culture completely alien to the mostly American students in the studio, despite the experience of that culture for ten days. And, even more than that these two factors, the challenges of the site were seemingly insurmountable, especially for a group of architecture students working for just one semester (15 weeks). Much as we enjoyed our time in Mumbai and felt excited by the project, we also felt daunted by the challenge - returning to Chicago wondering whether the site was actually suitable for tall buildings at all.

Mumbai is a simply staggering city of contrasts for the average westerner (let alone the average 21-year old architecture student hardly travelled beyond the US!). Despite my prior experience of Asia, having lived and worked in Hong Kong, Bangkok, Jakarta and Kuala Lumpur, I can honestly say that I have never experienced a city so much 'beyond capacity' as Mumbai. On the one hand there is an energy and a vitality about the city unmatched in most western cities, but on the other hand it seems that the Governance system has absolved itself of all responsibility to provide a decent level of infrastructure for the city's inhabitants to keep pace with the astronomical urban population growth (estimated currently at 16 million people and rising rapidly - 55% of whom live in slums or very poor housing conditions). The lack of infrastructure is apparent everywhere - in the



Figure 2. View down on C-ward district

gridlocked traffic, the people homeless on the streets, the ever-present garbage.

In many respects the C-ward is both a microcosm and an intensification of the issues facing the city as a whole (see Figure 2). In an incredibly dense, historic urban grain - mostly 5-6 storey buildings separated by narrow streets - the conflict between car vs. pedestrian, individual vs. community, and personal ambition vs. government support, is evident everywhere. The needs of the C-ward are pressing indeed. 40-45% of the existing buildings are dilapidated and deemed unsafe, and in the past few years there have been numerous deaths in the precinct from collapsing buildings and fire. These are the issues that RoMF have taken to heart in their desire to develop the area. Their plan is to use the C-ward development as a model to rebuild the city as a whole, utilizing a cluster based approach and a radically improved infrastructure.

One should not, however, mistake the C-ward for a slum. The 97 hectares (970,000 m²) area is a dense, proud, historic community of mostly working and middle-class people, some of whom have lived in the area for many generations; people who have both pride and a certain amount of disposable income, but who can't purchase a larger living space

because of the dire shortage of housing in Mumbai. People who can't purchase a car because a parking spot on the dense crowded streets costs five times more than the car itself. People who can't, or don't want to, reside out in the ever-increasing suburb because it is so difficult to commute in to their place of work. Thus they are prepared to put up with the lack of infrastructure and conditions of life there, for the advantages of living/working so close to the heart of the city.

Though we didn't quite know how to get there to begin with on our return to Chicago to start the design project, the objective of the studio was clear - to create a cluster of tall buildings that were inspired by, and relate to, 'place'. This is the *raison d'être* of all the tall building studios that I convene - to design tall buildings that are locked into the physical, cultural and environmental specifics of the setting, rather than continue the two design approaches that have predominated for most tall buildings around the world; (i) the isolated, glass-clad, rectilinear, air-conditioned 'box' (i.e. the 'commercial' model) or (ii) the sculptural icon. The forms that result from the second design approach may be more visually interesting, but the relationship between the building and place is still superficial, not extending beyond the visual. ➤

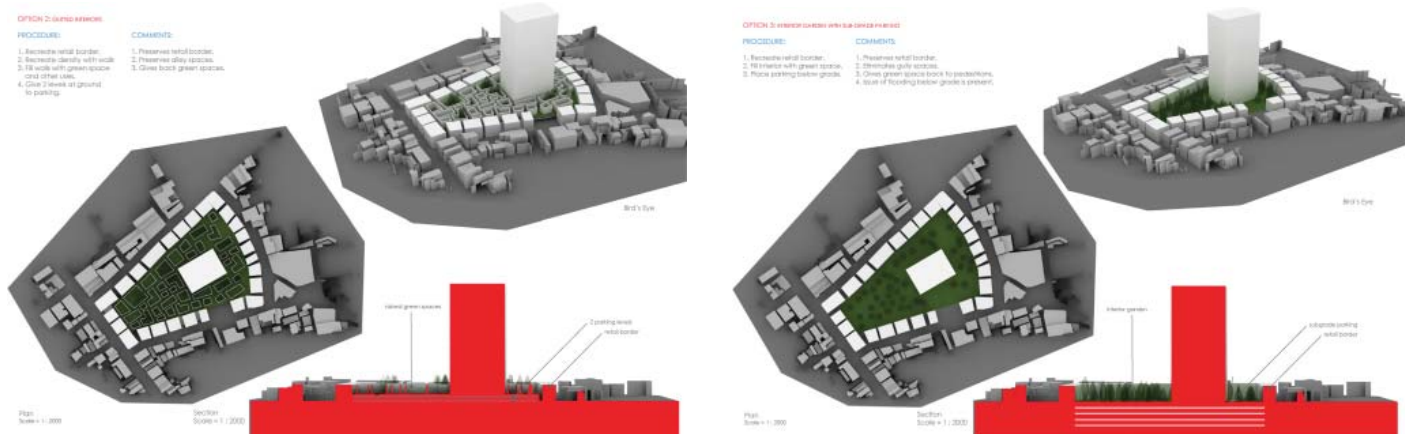


Figure 3a-f. Various solutions for the ground floor plane generically considered, aiming to keep the intrinsic character of the existing urban grain, whilst providing modern infrastructure to support new tall buildings and the C-ward as a whole.

The problem with both these approaches is the transportability of the models around the world without regard for the specifics of place, and the consequential homogenization of cities, where all urban centres are beginning to look the same. They may be identifiable by their unique set of high rise icons, but the language is a global one, with the architecture denying often hundreds of years of vernacular tradition in any given place, and rejecting established local solutions on how to relate buildings to both climate and culture.

The tall building studios I convene then seek to counteract the homogenization of architecture and cities by exploring appropriate 'vernacular' responses for the skyscraper – buildings that maximise their contact with both community and climate, and that challenge the preconception of tall on numerous levels, not least program, as well as form, expression and materials. We thus knew with the Mumbai studio that we wanted to reject iconic-ness for iconic-ness sake, and strive to do something else than maximise commercial gain. We knew we wanted to take the vitality of both the city of Mumbai and the C-ward up into the sky and to challenge the traditional office-residential-hotel functions that constitute perhaps 99% of tall buildings around the world – we just didn't know quite how to get there.

We began with a series of site strategies, exploring options of how to place tall buildings within the dense low-rise fabric of the six adjacent sites we had focused in on for the project from the wider district. One thing that was clear to us from our studies in Mumbai was that the unique character of the C-ward was largely due to the streetscape –

that series of tightly abutting 5-6 storey buildings that had grown together organically over 100 or so years and which defined both the narrow streets and the character contained within them. The problem was that those same buildings and narrow streets were preventing the implementation of a modern infrastructure that the area so desperately needed – mass transit, sewerage, power, waste etc. It was clear to us that the most inappropriate solution would be to sweep it all away and start again in a Le Corbusian type grand gesture, yet to try to superimpose modern towers on a non-existent infrastructure and crumbling ground floor realm would also be to ignore the reality of the situation.

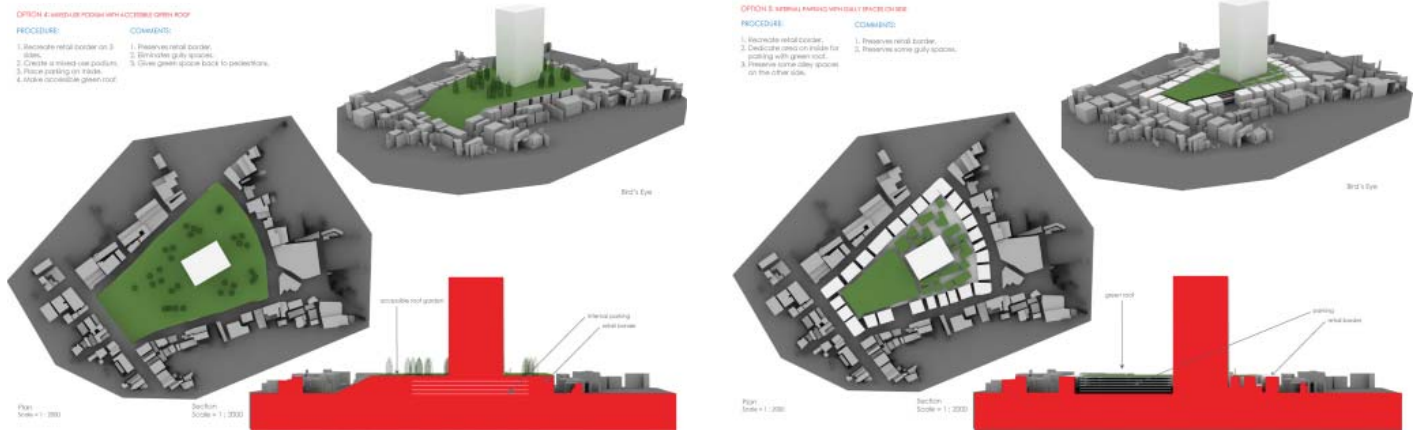
We thus developed a series of conceptual strategies for the sites that would allow the replacement of many of the buildings with a more modern replication of the existing, retaining the urban grain but then infilling behind this (since the lots between the main streets were typically deep and wide) with the infrastructure required of a modern tower in such a setting; the entrance lobbies, the service areas, the car parking.

At the same time we continued the urban studies undertaken in Mumbai to embrace current and future plans with respect to mass-transit and other planning strategies, as well as seeking to retain the character of the area beyond the main street frontages, through the replication of the narrow alleys within the sites where possible (see Figure 3a-d + 4).

It was a definite frustration of the studio that the project couldn't just concentrate on the urban strategy so as to come up with satisfactory urban-scale solutions, with the massing and ideas for the towers left strategic.



Figure 4. Site plan, showing the C-ward within the context of Mumbai and the five sites chosen as focus for the design studio.



The pedagogic requirements of the studio dictated that the students had to get through to an advanced level of design resolution of the towers themselves, including also a level of technical resolution, so the strategies at the ground floor, though clear, had to remain at that strategic level due to the constraints of time.

Once the site strategies had been completed conceptually, the students began to think about the design of their individual towers. The brief called for the twelve students to work in pairs to produce six towers on the adjacent sites, and here began the most difficult stage of the project. Symptomatic of many of the problems with the design of tall buildings in the real world (and despite the involved studies of culture and climate on the ground in Mumbai and the desire to create something 'local' and cohesive as a cluster) the students for numerous weeks could only produce collectively what can be described as a high-rise menagerie or zoo (see Figure 5) – a collection of weird forms and sculptural

icons that may have had some relation to site in themselves but collectively as a cluster had no cohesion whatsoever.

I have to admit at this stage that, though professor and supposed '*font of knowledge*', this process was a significant learning experience for myself as well as the students. It wasn't clear in those early stages how we could progress the project into something worthwhile and we had several miserable weeks of going sideways and backwards, with me desperately trying to convince and/or coerce the students to work as a group (something very difficult to do in the 'competitive' environment of an academic studio where every student is under intense pressure to get the highest grade etc – though that's a separate story).

The students weren't keen on the solution when it did come, and several took many weeks (if at all?) to be convinced, since it went against the very fibre of their architectural education; to forego their individual architectural instinct (and certainly ego) to

develop a design '*framework*'; a set of guidelines which they would all develop and adhere to. The intention was that this framework would give coherence within the scheme as a whole, yet allow individual design agendas and innovation within each tower. Though the strategy was generally unpopular within the group in the early stages (since they all desperately wanted to design an individual 'icon', for me it was clearly the breakthrough in the project (which, now half way through, hardly came soon enough as we were losing valuable time). A series of rapid massing models to test various options and solutions over a couple of weeks eventually settled the framework (see Figure 6). Interestingly, at this point, we also decided to concentrate on just five towers rather than six, and designate one student pairing to be the keepers of the overall strategic masterplan and specifically the design of the connections between the towers which we had all decided was a vital part of this new community in the sky. ✂



Figure 5. Architectural Design Stage 1: The students all designed individual 'icons' which resulted in something of an inappropriate architectural menagerie.

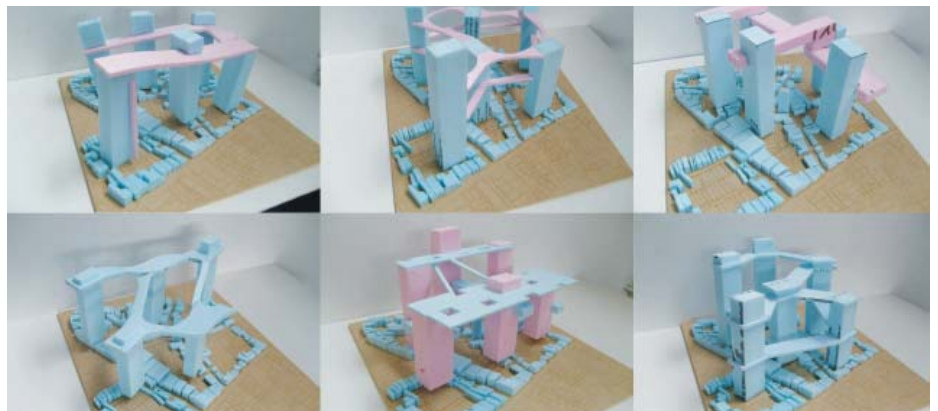


Figure 6. Architectural Design Stage 2: It was decided that we needed to implement an architectural 'framework' which all the towers would belong to. This framework was developed through multiple exploratory form models on the site.

And thus the framework for the scheme – five towers arranged in two rows of three and two, linked by two horizontal urban planes at roof level and a series of escalating skybridges from ground at the intermediate levels, was born. The towers were placed parallel to each other but slipped in plan so that each had clear views past each other (and access to both wind, light and ventilation) in both north-south and east-west directions. This angle of common plan orientation also related to the general urban grain so the towers didn't feel alien in positioning at the ground plane. Each tower thus had views to the sea on both the east and west sides of the peninsular that is central Mumbai, and views to the city to north and south.

Another important aspect of the architectural framework was the adoption of 6-storey common 'villages' or horizontal strata throughout the height of the towers (10 x 6-storey villages in total, though the horizon at mid-height 'skybridge' level was half-height i.e. 3 storeys). This was to be adopted as a strategy in each scheme to help sweep the scale of the existing urban grain into the sky, as well as give a further level of design unification across the separate towers. The strategy essentially sought to reject the scale-less solution of the extruded floor plan that typifies most tall buildings, and help give reference to the Mumbai typical urban grain below. Thus, as can be seen from the final architectural framework model (see Figure 7), the towers appear as vertical continuations of the typical urban blocks that occur at the ground plane, stacked on top of each other and side by side in the sky.

Once this strategic architectural framework had been adopted, it was with some relief (all round!) that the students could start to concentrate on their own towers within the framework. Each pair had returned from Mumbai with a clear and unique agenda that was born of something that had touched them whilst they were in the city – some pressing need that was not being addressed, or some aspect that was relevant to both Indian culture and the new high rise community they were creating. Thus one group has picked up on the lack of a sufficient

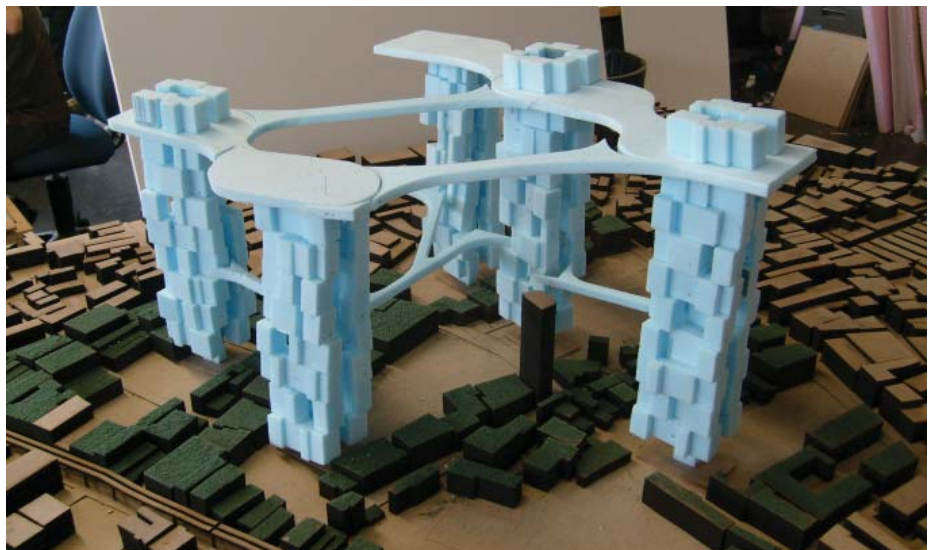


Figure 7. Final agreed Architectural Framework model

urban waste management system in the city (let alone a formal recycling program) and studied the intricacies of this in depth, whilst another had studied the education system and the lack of schooling in the C-ward. Another had researched the path of food into the city and the loss of agricultural land through development and expenditure of energy / carbon as a result of increasing food-miles involved with transport, whilst another had studied the vibrant textiles industry in the city, and specifically the *dhobi-ghats* or huge outdoor clothes washing areas that serviced the city. Staying on the cultural theme, another pairing had been influenced by the importance of water in the psyche of Indian cultural (from bathing in the River Ganges to the need for more water conservation) and chose to incorporate both cultural and recycling aspects of water in their tower. Finally the pairing that had taken responsibility for the overall vision and skybridges had been very influenced by the cultural festivals and processions that take place almost daily throughout India, and saw this idea of Yatra, or procession, as giving further reason for the skybridge route through the complex. All of the students had picked up on the dire shortage of quality public or community space in the C-ward (both soft or hard space, small or large) and sought to counteract that with the new scheme in the sky.

The programmatic brief for the towers had asked for a replacement of the functions on the site with an additional expectation of significant residential space to address the extensive housing shortage in Mumbai. Thus the students began to grapple with the complexities of designing a sensible residential

"I think the work here, from fourth and fifth year architecture students is extraordinary...I think what is interesting from my perspective is that five different buildings dealt with five different usages. Completely different, from one to the other."

Sudhir Jambhekar, Studio Reviewer
(Senior Partner, FxFowle)

tower overlaid with multiple functions according to both their site and agenda. Below is an explanation of each scheme as it evolved into a final state, within the overall architectural framework that had been established.

Annapurna Tower [Food Tower]

This scheme sought to create a new vertical residential community with high quality residential space linked to aspects of urban agriculture and food provision; partly as a source of income for residents, partly through a desire to introduce organic material and 'allotments' in the sky, and partly through a desire to create food at the point of need (see Figure 8a). This latter aspect was particularly important, to help counteract the loss of agricultural farming land in India through the horizontal spread of cities, and also to reduce the energy/carbon implications through the transport of food from farm to city on both a national and international scale.

In the final design solution then, we see the agreed framework of 6-storey residential villages, with a 'vertical farm' concentrated on the southern end of the tower (giving greatest aspect for sun). This vertical farm is also divided into 10 zones, aligning with the ten village 'horizons' throughout the towers (see Figure 8b). Each zone of the farm essentially becomes a 6-storey void which accommodates different aspects of agriculture, and consequential equipment, crop/livestock storage, intermediate decking within the void etc. Thus one village is focused on vegetables grown hydroponically, whilst another is dedicated to vertical fish farming, or chicken livestock. Unlike many vertical farm proposals then, which often comprise a single, large farming operation, this design organizes the vertical farming into de-centralized, 'cottage industry' type businesses, allowing for management in a fashion suitable to the cultural setting of India. As such, every resident is supplied with his/her garden or vertical allotment, either within the balcony/façade zone of their apartment or within this vertical farm. Each zone of the vertical farm (as well as the residential apartments) is naturally ventilated through the louvred glazed façade (see detailed section, Figure 8c). ↻

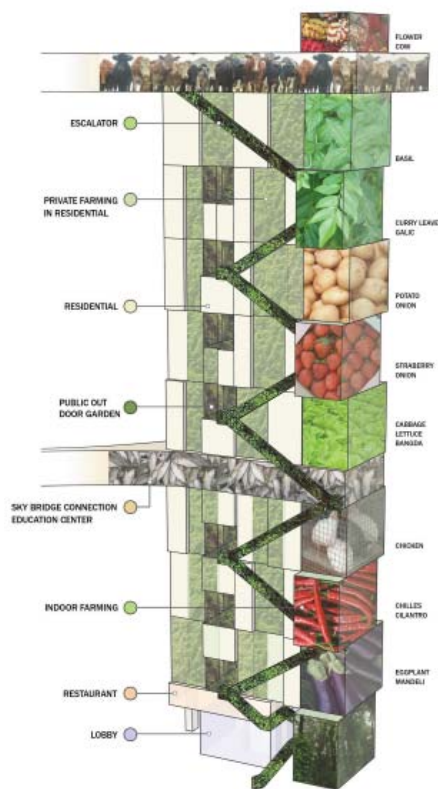


Figure 8a. The design sought to create a new vertical residential community with high quality residential space linked to aspects of urban agriculture and food provision.



Figure 8b. The 'vertical farm', concentrated on the southern end of the tower, is divided into 10 zones, aligning with the ten village 'horizons' throughout the towers



Figure 8c. Each zone of the vertical farm, accommodating hydroponic vegetables or livestock, is naturally ventilated through the louvred glazed façade



Figure 8d. Each member of the residential community owns an 'allotment' within either the vertical farm or their façade zone



Figure 8e. The external escalators provide a continual green corridor of vegetation linking ground and the high level urban plane, allowing for the migration of plant species throughout the tower and cluster. They also link a series of communal skygardens which perforate the residential part of the building.

“This is a really fascinating studio because it’s deliberately using tall buildings to try and explore solutions to some of the great challenges that exist in all of our cities today.”

David Scott, Studio Reviewer (CTBUH Chairman and Principal at Arup)

The vertical greenery is a vital aspect of the tower and positively embraced into both the form and aesthetic of the building. The facades themselves act to bring the maximum amount of organic material into the urban realm, reducing the heat island effect, sequestering carbon and providing residential shading and privacy. In addition a system of external escalators traversing the east and west facades allow the public to travel from the ground level to the farms in the sky, as well as the common high level public skybridges and urban planes. These escalator routes provide a continual green corridor of vegetation linking

ground and the high level urban plane, allowing for the migration of plant (and even animal!) species throughout the tower, the cluster and, by extension, the city of Mumbai. The escalators also link a series of communal skygardens which perforate the residential part of the building, giving both communal and green open space to the residential community (see Figures 8d + e). A farmer’s market at the ground floor plane provides urban enrichment and a vehicle for sale of the produce from the vertical farm for residents.

stage one:
creation of public "punched" spaces on building's rectangular massing

stage two:
experimentation of a stepping form in the public "punched" spaces.

stage three:
the conceptual idea of erosion is explored by defining the void spaces in the overall massing.

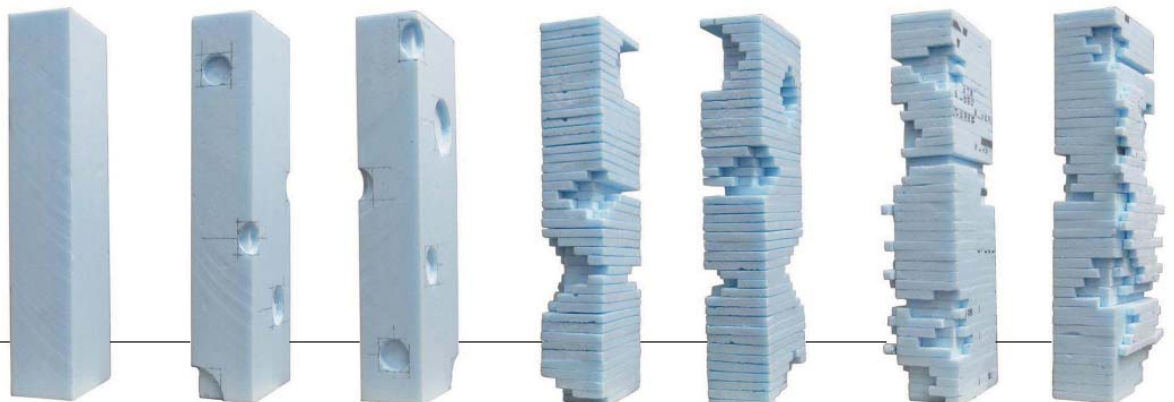


Figure 9a. The final form of the building, inspired by the idea of water eroding rock, was developed through an exploration of physical models



Figure 9b. The design creates a series of large-scale cut-away organic volumes, utilized for practical and leisure functions connected with water, such as pools for recreational and cultural bathing etc.

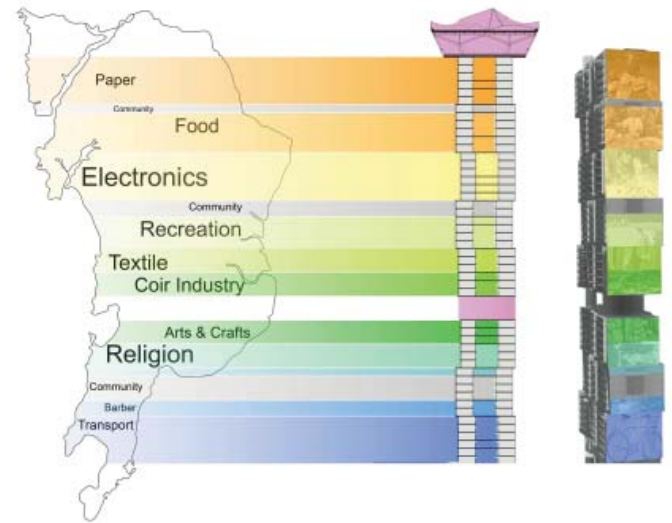


Figure 10a. The design positively embraces the concepts of locally-available, reclaimed, recycled materials into the materiality of the building e.g. sliding bamboo panels.

Barsaat Tower [Rain Tower]

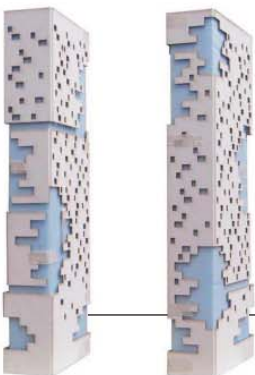
Recognizing the environmental and cultural importance of water in India, this residential tower sought to collect and redistribute the maximum amount of rainwater from the building, site and high-level urban planes for recycled usage within the vertical community. At the same time the design sought to focus the tower community around the subject of water and incorporate public water functions into everyday living environments. The form of the building, inspired by the idea of water eroding rock, was developed through an exploration of physical models (see Figure 9a). The final solution creates a series of large-scale cut-away organic volumes within an otherwise orthogonal tower (see Figure 9b).

These public, semi-public and private urban spaces are utilized for varying practical and leisure functions connected with water, such as pools for recreational and cultural bathing etc. The building skin is constructed of a permeable, adjustable layer of terracotta louvers which allows for rain-water catchment and solar shading whilst also creating an opaque building skin that contrasts with the transparent, crystalline cut-away spaces. Though this tower design had some interesting aspects to it, this was the least resolved of the five towers created, and the design that least bought into the agreed architectural framework, rejecting the idea of the horizon villages and other aspects.

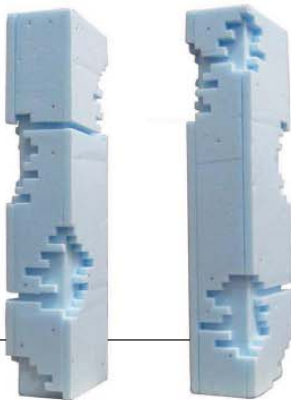
Bhargar Tower [Tower of Recycling]

Inspired by issues of waste management (or lack thereof) in Mumbai, this design sought to create a residential community bound together by aspects of material recycling and waste management (see Figure 10a). The design positively embraces the concepts of locally-available, reclaimed, recycled (and re-usable) materials into the materiality of the building. For example, much of the façade is made-up of sliding bamboo panels (over both the glazed curtain wall and open balcony areas) that can be opened up to provide fresh air and natural ventilation, or closed to provide shading and privacy (see Figure 10b). ➔

stage four:
development of private exterior spaces
on the facade.



stage five:
void spaces transform from private
spaces to public/communal and
private.



stage six:
study in how the void spaces "the
jewels" interact with the interior/
exterior spaces.



stage seven:
application of facade catchment panel
system.





6am: interior bamboo partially open with exterior bamboo completely closed.



12am: interior bamboo completely closed with exterior bamboo partially open.



6pm: interior and exterior bamboo completely open.



12am: interior and exterior bamboo completely closed.

Figure 10b. This design sought to create a residential community bound together by aspects of material recycling and waste management

A series of recycling / waste management centers are created throughout the building, with each focused on a particular material or trade (paper, metal, plastic, leather, etc). These waste/recycling areas are organized to allow for management in a fashion suitable to the cultural setting of India i.e. through decentralized, 'cottage industry' type businesses, to be run by residents. Thus the concept is to sweep up into the vertical community the same cultural practices of waste management that currently take place at the ground floor urban plane in a city like Mumbai – localized, and conducted largely by the individual. In addition, at the ground floor, a 'Banghar' (Waste) Market is located for the handling, recycling and trading of excess waste products produced by all the towers in the complex.

Gyana Tower [School Tower]

Inspired by the lack of educational facilities and opportunities for learning in the C-ward, this design sought to combine residential units and a school within the same vertical tower (see Figure 11a). The tower consists of a series of stacked villages with each floor plate housing both residential units and school facilities in a vertical split arrangement, sharing a common core (see plan, Figure 11b). The school is orientated to the south, with the 6-storey school villages wrapped around a series of large, semi-public atria. The residential units are orientated to the north around smaller, more private atria. The larger atria house a variety of facilities that are shared by both the schools and the public out of school hours – libraries, cafeteria, basketball courts



Figure 11a. This design sought to combine residential units and a school within the same vertical tower.

and playgrounds – providing a valuable resource for the wider community (see Figure 11c). The school also accommodates residential dormitories for the children.

In addition, a system of external escalators traversing the southern façade allow the public to travel from the ground plane to the high level public skybridges and urban planes, and to interact with the public spaces throughout the building. Like in the Annapurna (Food) tower, this escalator forms a continual green corridor of vegetation linking ground and sky, allowing for the migration of plant species throughout the tower and providing solar shading to the spaces beyond.

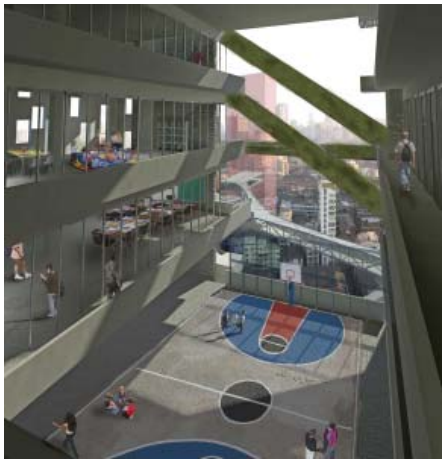


Figure 11b (Left). The tower consists of a series of stacked villages with each floor plate housing both residential units and school facilities in a vertical split arrangement, sharing a common core. 11c (Right). The 6-storey school villages wrap around a series of large, semi-public atria housing a variety of facilities – libraries, cafeteria, basketball courts, playgrounds etc.

Swadeshi Tower [Textile Tower]

This design is inspired by the large urban areas dedicated for clothes washing and drying in Mumbai known as the Dhobi Ghats. The tower seeks to create a vertical residential community with high quality living space bound together by aspects of textiles and clothes washing (see Figure 12a). The clothes themselves become an integral part of the building's expression, with the building skin being the interface for clothes drying, a common sight in many Asian skyscrapers (see Figure 12b). In turn the clothes that are a transient but integral part of the façade give solar shade to the residential spaces behind. The concept of textiles is further integrated into the building aesthetics and materiality through the application of a woven-like cladding in the facades, also providing residential spaces with shading and privacy (see Figure 12c).

The plan-form of the building is keenly inspired by vernacular patterns of living in India, with cellular spaces arranged around a large external area which serves as the outdoor communal area, overspill place for internal functions, cool place to sleep in hot season, area for washing clothes etc (see Figure 12d). These 'veranda' type spaces also act as the circulation area for the apartments, the 'hub' of the whole residential unit through which everything else resolves. ➤

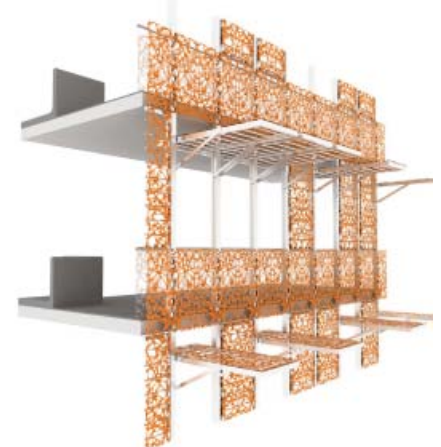


Figure 12a. (clockwise) This design seeks to create a vertical residential community with high quality living space bound together by aspects of textiles and clothes washing. 12b. The clothes become an integral part of the building's expression, with the building skin being the interface for clothes drying, a common sight in many Asian skyscrapers. 12c. The concept of textiles is further integrated into the building aesthetics and materiality through the application of a woven-like cladding in the facades.

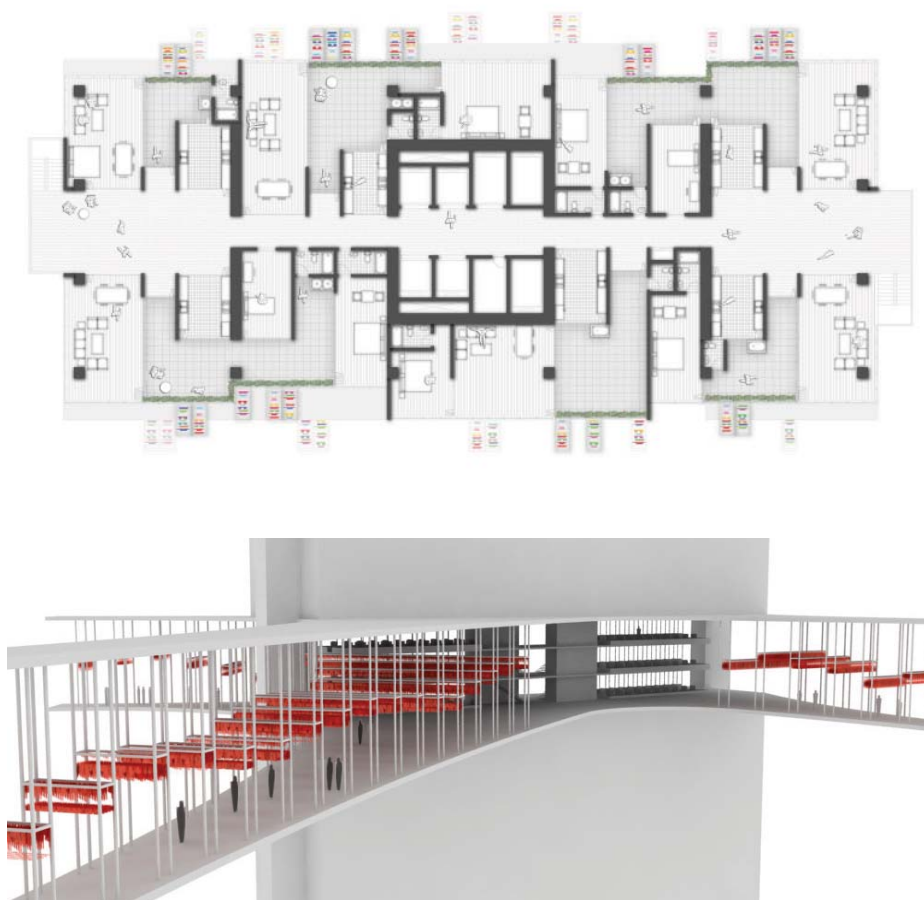


Figure 12d (Top). The plan-form is keenly inspired by vernacular patterns of living in India, with cellular spaces arranged around a large external area which serves as the outdoor communal area. 12e (Bottom). The communal level at the mid-height common skybridge level is the *dhobi ghat* public centre of the building and community, spilling out along the skybridge route.

...skyscraper-faith

“It takes a leap of faith to build a skyscraper-faith that the future will be brighter and that our economy will deliver the jobs to fill all those floors.”

Joseph J. Plumeri, chairman and CEO of Willis Group Holdings is commenting on how companies can restore trust in American business after last year's events. From a 'Commentary' article, Chicago Sun-Times, October 29, 2009, p 22

The introduction of this big, external space into the heart of each plan also allows the natural ventilation of the apartments, and cross ventilation throughout the building. The clothes are hung from specially designed façade sections which swing out horizontally from the external veranda space. The communal level at the mid-height common skybridge level is the *dhobi ghat* public centre of the building and community, spilling out along the skybridge route (see Figure 12e). The ground floor relocates a new large textile market currently on the site, as well as the building entrance lobby and associated facilities.

The final work of the studio was exhibited at the annual Open House of the College of Architecture at the Illinois Institute of Technology in May (see Figure 13a+b). I think observers were both amazed and appalled in equal numbers as this superimposition of a vertical future for the low-rise C-ward of Mumbai. Beguiled by every day iconic images of adventurous architectural forms in trade press and elsewhere, I doubt that few could truly appreciate the epic journey and struggle the studio had been on, irrespective of their thoughts on the final product. As I purveyed the final scheme myself, I felt mixed emotions. On the one hand it looked gargantuan in scale and alien for the site (though that was a product of the brief for which the students could hardly be blamed). However the site model itself was somewhat deceiving – the numerous and increasing high rise towers in Mumbai were just beyond the site's edges and, for good or bad, there would certainly be a high rise context there in 20 years which was absent presently.

But, on the other hand, I was quite pleased with what we had produced as a group, despite the difficulties of site, culture and the logistics of getting twelve, strong-headed students to transcend personal ego and work together to the common good. I felt pleased that the scheme did have a clear harmony within it, and yet allowed varied and interesting design approaches within each tower separately, related to the setting. Putting aside what the scheme looked like, or portrayed, one thing I felt very sure of was that we had succeeded where many tall buildings had failed – in bringing the richness and multi-functional vitality of the city into the sky; a community of residential and schools, sidewalks and parks, agriculture and community clothes washing, cottage industries and communal bathing, as well as the inevitable shops, restaurants and other public facilities that would result. As we make a push for ever-taller, ever-denser cities around the world as a necessary response to climate change and the need for more sustainable patterns of life, it seems nonsensical that the real world is not doing that.



Figure 13a. The professional community survey the final results at the IIT School of Architecture 'Open House' exhibition in May 2009. The planned India Tower can be seen at left.



Figure 13b. Jan Klerks (CTBUH Chicago), Sagree Sharma (Arup New Delhi) and Greg Lakota (Halvorson & Partners Chicago) reviewing the final design, with students.



Figure 14. IIT Students with Professor Wood and students from Rizvi and Sir JJ Colleges of architecture in the C-ward.

Though of course the project was theoretical and thus absent of many of the financial and logistical implications of *'the real world'*, the students had worked with real integrity to produce something unique and relevant to Mumbai – and something most clearly born of the place in which it sat. This was most definitely not a scheme that could be picked up and transported to Moscow or Melbourne and still make sense. So we had succeeded, at least in part, with suggesting a new vernacular – as well as a new urban vision – for Mumbai. I was very proud of them for that.

Acknowledgements

I would like to thank the Remaking of Mumbai Federation for their kind support and sponsorship of the 2009 CTBUH-IIT Mumbai Studio. I would also like to thank the following external colleagues who assisted in varying roles tutoring and/or reviewing the students: Mr. Mayank Gandhi (Remaking of Mumbai Federation, Mumbai), David Scott (Arup New York / CTBUH), Sudhir Jambhekar (FxFowle New York), Sagree Sharma (Arup New York), Greg Lakota & Carrie Warner (Halvorson & Partners Chicago), Philip Oldfield (University of Nottingham / CTBUH) and Jan Klerks & Katharina Holzapfel (CTBUH Chicago).

Above all, I would like to thank the 12 intrepid students themselves: Cindy Duong, Nathaniel Hollister, Irene Matteini, Nishant Modi, Adam Newman, Hiren Patel, James Rossi, Jonathan Reinecke, Shin Young Park, Rafal Stawarz, Jacqueline Villa, and Jason Walker. Thanks guys (and apologies for working you all so hard!). ■

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