Wanted: Tall Buildings Less Iconic, More Specific

Jeanne Gang

Principal and Founder, Studio Gang Architects, 1212 N. Ashland Ave. Suite 212, Chicago, Illinois, United States of America
Tel: +1 773 384 1212, Fax: +1 773 384 0231, Email: jgang@studiogang.net

Biography
Jeanne Gang leads Studio Gang Architects, a practice that has designed award-winning projects since its inception in 1998. Ms. Gang’s design in the field of architecture is supported through a mode of working that combines practice, teaching and research. As adjunct professor at the Illinois Institute of Technology she has taught architecture since 1998. As visiting professor she has taught at the Harvard Design School, Yale College of Architecture and the Princeton School of Architecture.

Ms. Gang leads design through exploration and research early in the design process. Her work has staked out new creative territory in materials, technology and sustainability. Recent projects include the winning entry for the Ford Calumet Environmental Center and the eighty-story, currently under construction residential “Aqua Tower” in downtown Chicago. The work of Studio Gang has received numerous awards and has been published and exhibited widely. Studio Gang’s work has been featured at the Art Institute of Chicago, the National Building Museum of the Smithsonian Institution, the International Venice Biennale. Ms. Gang was chosen to lecture as one of the Architecture League of New York’s Emerging Voices in spring of 2006 and received an Academy Award from the American Academy of Arts and Letters in the same year.
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Abstract
The industrial revolution and all of its facets led to the design of some of the most notable high-rises of the twentieth century. Architecture was able to respond to its time with a powerful formal language that reflected ideas about art, culture, economics, and even health. Today with the amount of attention being paid to high-rise design, it would appear that progress is being made in this typology, but this paper argues that despite the conditions being right for a break-through, designers have missed an opportunity to address real change in progress. This paper attempts to point out a few strategies for breaking out of purely image-driven high-rise design and the importance of doing so.

Keywords: Design, Strategy, Ownership, Sustainability, Labor

Introduction
On the surface, it would appear as though the tall building as a type has made substantial progress in its design in recent years. Evidence of new and unusual form is appearing, heights surpassed, and books and websites devoted to the subject have increased substantially. In addition, architecture schools have addressed the design of the high-rise, a building type formerly thought to be too corporate to warrant investigation. A wider range of architects, not exclusively corporate firms, is being asked by owner-developers to design the high-rise. Yet, when examined more critically it becomes apparent that much of the latest design work has not progressed so far after all. The question posed here is whether current work is significantly transforming the high-rise type and addressing important contemporary issues. Are designers mining the cultural, environmental and economic potentials inherent in the type or are they simply manipulating form for form’s sake? Perhaps the quantity and speed of commissions is preventing critical analysis or perhaps we have all become content that owner-developers today are finally beginning to ask for design. Clients are asking for “icons,” recognizing “added value” in a post Bilbao-effect world; perhaps architects are willing to prove this theory true rather than critically examining the typology.

To be sure, there have been advances, yet somehow, it seems that the combination of new tools, design talent and money should be producing more change and across a wider spectrum. It can be argued that this problem is due to the fact that architects and clients are still focused on symbols. The high-rise as a symbol is a carryover from days when there were very few tall buildings in a city and therefore, the thinking goes, the tall building must be a monument. The city of the future, however, will have many tall buildings. The symbol, though, becomes less compelling when one imagines walking down a street lined with them.

There is much more to our current place in architectural history than symbol and iconography. Rather than symbol, the specifics of each environmental condition, culture, lifestyle and the tools and methods we use to build should be the basis for a new kind of high-rise building that would inherently “add value” but also transform cities. Responding to specific criteria should help create the guiding principles.

A search for a set of guiding principles for high-rise buildings began early in tall building development, brought about by a field of eclectic work and the concern over what the building type would do to cities. As the first batch of tall buildings was completed, Louis Sullivan argued in “The Tall Office Building Artistically Considered,” that high-rise designs of his day proved that architects felt the need to show off every formal move they knew without reflecting on the function and purpose of the tall building. Faced with the problem of typology, he complained that the trained architect was “beset by dread lest he be not copious enough in the display of his wares; lest he betray, in short, a lack of resources.” (Sullivan, 1896)

Later, New York City set the rules for high-rise development through a progressive set of guidelines in its new ‘Zoning Law’ passed in 1916. Its purpose was to allow pedestrians access to direct sunlight on the street, which in turn required setbacks in the building form. Increased height was allowed with increased setback from the street. The zoning gave architects and owners a reason to invent something new by prioritizing the ordinance’s rules and letting go of the old Beaux Arts styles. (Kilham, 1973) With regulation focused on the quality of the city, as opposed to a concern to create icons, the criteria helped shape an entire generation of buildings while allowing flexibility in design.
A review of contemporary designs

Today, many contemporary high-rise designs suffer from a lack of purpose, easily and similarly opting for the display of each architect’s formal “wares.” Cities lack powerful regulation that would require buildings to respond to their particular climate and are content to pass arbitrary height regulations or timid and only incrementally stronger codes with regards to environment.

The design community is in an eclectic phase where anything can become a reference. Some architects give reasons for what they have designed for a specific place – only to be found repeating the exact same design later under totally different circumstances.

Herein, the term ‘specificity’ is not referring to vernacular symbolism used to reflect local culture or meaning. (Howler, 2003) Rather, it is an argument that the many criteria for informing the design of a high-rise (its specific site, environmental response, cost model, construction tools, technology and contemporary cultural ideas) could, if thoughtfully deployed, create a new architecture for this building type. This leads to a critique of the theme of the last CTBUH conference, “Tapered, Twisted and Tilted,” and raises the question - Is that all there is?

If today’s designs did embody extremely powerful ideas on multiple levels, then they would not be limited to formal one-offs. Concepts would be adopted more widely, like open-source software. A contemporary ‘movement’ in high-rise design that would address the issues specific to our time could potentially lead the way, (as did modernism, for better or for worse), to a positive transformation of cities on every level.

Symbolism remains the knee-jerk reaction to high-rise design. Buildings such as the ones diagramed in Figure 2 show that architects have not fully moved beyond post-modernism. There is still an attachment to symbolism, even though the symbols have changed. In architecture, a formal reference to a Möbius strip is just as symbolic as a reference to a Doric column. Current structures use form and shape to reference birds, pagodas, domes, and many other forms. To be fair, some of the iconic buildings, like the 30 St. Mary Axe (a.k.a. “The Gherkin”), have a strong climatic response and contribute more than a pure symbol to high-rise design. However intended or unintended these images are, they tell us that the high-rise design still struggles to move beyond the singular and iconic and toward ideas that are generated from specific attributes (such as climate) that would make them more relevant to today’s inhabitants.

Potential Strategies for a ‘specific’ high-rise

Outlined here are 6 areas that hold promise for the design of a new kind of highly specific high-rise: 1. Environment and site specificity; 2. Structural iterations and local conditions; 3. Non-singular: a high-rise connected community; 4. Construction methods made visible; 5. Labor and craft from the local; and 6. Cultural and market conditions.

These subject areas have not been sufficiently addressed or are just beginning to be addressed by designers. They have the potential to transform the high-rise type into a more interesting multivalent building form. While they all maintain very strong formal implications these issues don’t use form (or symbol) as the starting point.

Many factors have changed since the first high-rise designs took shape. If these current issues would be embraced by designers and explored more fully, the potential for a significant change for the high-rise building would be within reach for our generation.

1. Environment and site specificity

Environmental concerns are urgent and point to a need for a transformed high-rise typology. This consideration taken seriously offers not only a different aesthetic but also expanded functions for the building type. As populations move to city centers, more and more aspects of urban dwelling will need to be accommodated within tall buildings including residential, commercial and community functions.

It is no longer enough to simply ensure zoning-mandated light and air as New York’s zoning
code once did. Cities need to aggressively regulate the energy use of new buildings. In doing this they will essentially be mandating new building form.

The act of making a tall building today compels designers to consider the energy use as a critical design factor and this factor is climate-specific. A number of new buildings point to this new direction; almost all of these buildings are the result of strong interdisciplinary collaborations. Working together, environmental, structural engineers and architects are well positioned to make further breakthroughs in climate specific design.

Responding to climate would create bands of high-rises with latitudinal specificity. At 41.793 degrees north, an upcoming residential building called Solstice, by Studio Gang with Arup engineers, will respond to the sun’s summer angle with its geometry. It is carved out to create a self-shaded south-facing façade. The angle of the façade is optimized to respond to its climate.

Buildings can also be specific in relation to the ground at their base. It is important in order to make this territory available for pedestrians rather than designing in a preference for cars.

The Scala high-rise proposed by BIG spreads program out at its base to meet the street and in doing so suggests an inhabited stepped surface on its exterior.
example) rather than merely stacking in pancake-like fashion. They could do much more with their great height to harvest light and wind for energy production, as a few new buildings have shown. The idea of a specific response to the conditions has powerful implications for almost any high-rise design. This approach would help move the building type away from the monolithic and symbolic gestures we see so often today.

2. Structural iterations and location conditions

Loads on buildings are still required to come to the ground as they have always been. Nothing has changed about that. What has changed is the increased speed and productivity of software tools used by the engineer. These software tools give structural engineers a new ability to analyze design iteratively and to propose multiple solutions. This creativity afforded by the software, coupled with the contemporary ability to manufacture digitally, is reminiscent less of the immediate past and more of the first 20 years of structural design for tall buildings when massive invention occurred. A wide variety of column shapes were designed by engineers, each of which responded to very specific conditions of loading, weight, workmanship, and cost.

With today’s technology, these specific qualities could be re-examined for design and manufacture since it is now possible to design structures with a much finer level of exactitude. During much of the twentieth century, it was necessary to over-size members and to regularize them, in order to avoid re-calculating the entire structure with slight architectural changes. There was a quest for hierarchical order. Now engineers are able to analyze many permutations and have the ability to analyze forces that are affected by local conditions, not simply the ones acting in a Newtonian straight line. This gives structure the potential for a specific and local response resulting in a much finer and perhaps more irregular grain. (Balmond, 2002)

3. Non-singular: A high-rise connected community

Non-singular non-symbolic ‘cluster-towers’ can be found in a few recent proposals that have yet to be built. They are able to go beyond a singular icon by multiplying the vertical shafts into a grouping. This approach can be seen in a proposal for the World Trade Center, designed by the team of Richard Meier, Peter Eisenman, Charles Gwathmy and Steven Holl, in which four horizontal linkages connect a series of point towers cores. The cluster tower approach is also visible in OMA’s Hyperbuilding, which proposes a large platform half way up, introducing public space in the sky. The Louisville Museum Plaza building by REX also uses this strategy. The benefit of the cluster-towers are the connections on levels that are above the ground plane; an interesting development that starts to reflect the contemporary condition of mixed uses, multiple ownership and public space woven together in the sky.

Figure 7. With the introduction of steel replacing wrought iron, massive invention and creativity occurred in the first twenty years of high-rise design. Without standard shapes to choose from, engineers competed to design and patent steel column shapes that were compared and contrasted in terms of eccentric loading, weight, workmanship, cost and availability. The array of column types reveals a fascinating moment in time for the tall building in which the engineer’s search for “form follows function” produced both incredible variety as well as specificity and rigor in design. (Freitag, 1912. p. 206)

Figure 8. New typology: because the cluster tower increases the number of vertical shafts and provides additional horizontal connections at the upper levels, it increases the exterior wall dramatically. The rejection of efficiency so fundamental to the original high-rise type suggests that the cluster tower should be considered a new type of building altogether.
Like a bridge, the cluster-tower is inherently very specific. Its purpose is to connect specific points on a site or in a city. Because the horizontal surfaces must be clad on all sides and the individual vertical shafts are narrow, the cluster approach rejects a certain efficiency of the single tower by increasing the surface area of the exterior envelope dramatically. For this reason, the cluster-tower practically needs a new category and should be thought of and developed as a different building typology altogether.

4. Construction methods made visible

Construction and delivery time are two of the primary determining factors in the cost of building a high-rise. Breakthroughs to decrease time are many and include things like new mixes of concrete that find their strength earlier, as well as the formwork systems that can be removed sooner after pouring. Designers could do much more to engage the construction aspect of high-rise buildings, but they have been trained or scared away from “means and methods.” There is fertile ground for exploration if the owner, the architect/design team, and the contractor could explore these questions together. Designs such as Marina City Towers in Chicago were imagined simultaneously with ideas about how the building would be constructed. The final form offers a satisfying visual connection with the processes that were used in its making.

Today’s concrete forming technology could do the same, for example. Think of how relatively new “tunnel formwork” or “flying formwork” could start to inform a design approach. If the construction methods were engaged more fully by the entire design team, designers would want to start to reveal their construction, a more compelling notion than symbol.

5. Labor and craft from the locale

There is interest in all things digital and robotic in architecture, as demonstrated in volumes of architectural journals and the rhetoric used to describe buildings. However, the construction process of tall buildings maintains aspects that are inherently un-robotic. If we were to step back and take a look at the bigger environmental picture, a more progressive avenue to be explored would be to imagine making a building more (instead of less) ‘handmade.’

An emerging importance is employing people in lieu of energy and machines. Economists have pointed out that problems of growing inequity, unemployment and environmental degradation could be solved by reducing the tax burden on labor so that it would cost less, while at the same time placing a heavier burden on natural resource use so that it would cost more. (Ayers, 1998 cited in Hawken et al., 1999). Sustainability = Jobs.

Architecture must explore this critical human involvement if it is to claim a sustainable worldview. With population exploding and over six billion people in the world, 200 million are unemployed and 550 million make less than $1 a day (ILO, 2006). A large population could be contributing and earning a livelihood but, in the present economy, aren’t able to do so. Since many new high-rises are proposed in countries facing these issues it should be possible for design to address this.

An idea for tall buildings could be to make the presence of people visible in the physical object. Yes, high-rises already provide work, but an aesthetic of handmade elements could be introduced to a market hungry for a Martha Stewart-esque crafted quality. Imagine a macramé or woven façade, made by people – not robots. Labor is, in essence, energy; why substitute all of that energy with machines? We can be interested by the possibilities and continue to explore the potential of digital means of fabrication, they are not mutually exclusive.

6. Cultural and market conditions

Different kinds of people build high-rises for different reasons today. In the past, mainly large corporations built tall buildings, as they were powerful and stable entities. What changed is the presence of new production processes and technologies, coupled with deregulation, ended industrial economies of scale that gave large corporations this sole ability. Inventions and technologies initiated during the Cold War in the 1960s (in the US at NASA and the Defense Department) supported a global transformation and expansion of capitalism that has affected our contemporary cultural experience.

Now, tall buildings are frequently speculations built and sold to new owners or many owners, as opposed to monuments defining unchanging corporate identities. In more and more democracies, consumers and investors have more influence than ever before and power has shifted to them (Reich, 2007). For architects and engineers, this factor should trigger a new design response.

Figure 9. Marina City Towers’ slip-form and precast construction are visually evident in the final design. (Daimant, 1967)
Since economic structure is a fundamental part of how high-rises come into being, it should be regarded as a potential generator of ideas. The spread of capitalism and its responsiveness to consumers and investors has redefined many aspects of the residential high-rise construction – except for its design implications. This area has not been fully explored other than acknowledgement that consumers now want to consume “design.”

Owners have responded quickly. In the U.S. residential high-rise business, there is a sophisticated system for the marketing and sale of condominiums. One feature used to sell space is the variability and changeability of the size and layout of the dwelling unit itself. Marketing now gives buyers what they want by allowing purchasers to suggest changes to the floor plan, a domain once given solely to the designer. Now many buyers can demand change very late in the design process, even into construction, and design teams are required to keep up throughout the cycles of revisions.

A new design model reflecting this condition of change suggests a building with a much higher degree of flexibility and adaptability. Or perhaps this situation suggests further customization in buildings, the logistics of which is now possible to manage through software. What if buildings could be mass-customized more like the tennis shoes that can now be designed by consumers on-line? (See the NIKEiDStudio at Niketown in New York for self-customized shoes.)

Studio Gang proposed a structure called “U-Design” that would allow for mass customization in its façade by incorporating a buyer’s preferences into its exterior envelope.

![Figure 10. Partial façade elevation of “U-Design” by Studio Gang: a proposal that attempts to respond to consumer demand with a system for mass-customization of a façade that buyers could design for themselves. Color, window type and glazing are a few of the elements from which to choose in this study for a development in Chicago.](Image: Studio Gang, 2004)

**Conclusion**

Any movement in architecture needs to be followed by more than just a few architects; it needs to be followed by many. This call for ‘specific’ over ‘iconic’ in a way asks for architects to spread out in their conceptual approach rather than to cohere. But this is precisely the point. Incredible possibilities lie in starting design from many different local conditions. Our time is about being able to tap into the specific; our technology allows us the ability to be incredibly precise. By following the specific criteria for environment, site, market, construction technology and labor pool – to name just a few categories from this paper – a new kind of more intelligent high-rise that is “of our time” will be born.

The problem is that the highly visible position of the tall building in global culture has led to one-liners and symbolism in a superficial battle for identity. Designers have greatly ignored the un-tapped potential of this building type and, in turn, are missing the opportunity to have a role to play in shaping economics, politics and the environment. This is not to say that the high-rise can solve all ills if made more specific, but simply an acknowledgement (and call for the use) of forces and abilities already in play in the making of vertical structures.

**References**


