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Tall Building Design Intelligence: An International Perspective

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Biography

Stephan C Reinke has worked in the international arena for twenty years developing an in-depth experience in Europe, the Middle East, North America and Asia Pacific. He joined the Woods Bagot London Studio as a Director in 2000, and became UK/Europe Regional Managing Director in 2005. As a UK, EMEA practitioner, he has extensive office, mixed-use and hospitality experience.

Stephan is a leading architect in the design and delivery of tall buildings and major urban developments and he has extensive experience in design and project delivery as an integrated process.

Stephan was the Principal responsible for the 36 level hotel, conference centre and serviced apartment complex at West India Quay in London, the 40 level Raffles Riverside Tower Complex in Moscow, Russia, the 44 level Southern Cross Corporate Centre in Melbourne, Australia, the 60 level Inacity Tower and Urban Regeneration Scheme in Manchester, the West India Quay Tower and the Liverpool Central Plaza Redevelopment.

Stephan has made numerous contributions to magazines and journals regarding architecture, urban design and project delivery. Stephan was the Founding President of the American Institute of Architects London-UK Chapter in 1993 (The First International Chapter of the AIA). He has served as Chairman of the AIA's International Committee and is currently an appointed member of the RIBA's International Affairs Committee. In 2004, Stephan was elevated to the American Institute of Architects College of Fellows.

“Our international profile is being defined by the design excellence of our work - I believe the talent, experience and energy found in our international studios is pushing the envelope.”

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Abstract

The design of tall buildings in the early part of the 21st Century is not necessarily being informed by day lighting, net to gross ratios, utilisation or flexibility for a multiplicity of occupants and tenants. The *raison d'être* is rather to create an identity; a brand which generates powerful imagery in the cityscape relating to a specific organisation or corporation. In essence, an iconic shape supersedes a well-planned and rational, residence, hotel or workplace. In short, it is about aspiration and legacy.

Keywords: tall building, identity, iconic shape

Introduction

These progressive thoughts and challenges are not the result of an enlightened late 20th Century architectural debate, or even in the early years of the 21st Century. They were in fact put forward by one of my Chicago home town heroes, Louis H. Sullivan in 1896 an article entitled, “*The Tall Office Building Artistically Considered*” in Lippincott’s Magazine, USA (March 1896). In line with the word *Aspiration* comes the 21st Century tagline for something which is really enormous; *Mega*. Another early 21st Century moniker for gigantic is *Super Tall*. It may seem appropriate that these descriptions are a product of the types of projects we currently see undertaken on a global basis and it is only within the past couple years that the television programme, *Mega Structures*, has appeared on the Discovery Channel. However, again the ideal of designing and building something really big is not new and, has existed since the time of the Great Pyramids. From my perspective, The Age of Enlightenment, signals the crucial point of departure for the fusion of Vision + Mega which we relate to as we begin a new century.

Towards the end of 17th Century, a group of visionary architects in France developed ideas which were truly Mega in scale. These designs reflected a reverence for the evolution of a new discipline called

science as well as sentiment, and were also imbued, in a number of cases, with a fiendish sense of humour. The best known of these visionaries, Étienne-Louis Boullée, admired the clear, bold lines of neoclassic architecture but considered emotion equally as important to architecture as classical rules of proportioning. In his writing, *Essai sur l’Art*, which remained unpublished until 1953, he pleaded for a “monumental architecture which employed both emotion and reason”.

In these designs, made between 1780 and 1790, Boullée worked in an abstract style that seems ultra modern, even utopian. In spite of his many achievements, he is chiefly remembered for the drawings of the visionary projects that were considerably beyond 18th Century technology.

So, at this place in time, there was a vision for mega buildings that could shape a nation. Of course, the missing component was the ability to actually construct these extraordinary visions. This confluence of events or space in time leads to the ideal of Synchronicity which is defined as: things that like to happen together in a meaningful way at a given moment in time. Boullée had a vision, but technology did not come together with his mega view at that moment in time.

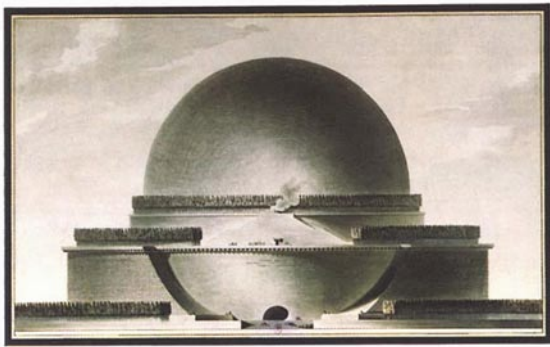


Figure 1 & Figure 2 Étienne-Louis Boullée, Cénotaphe a Newton 1783

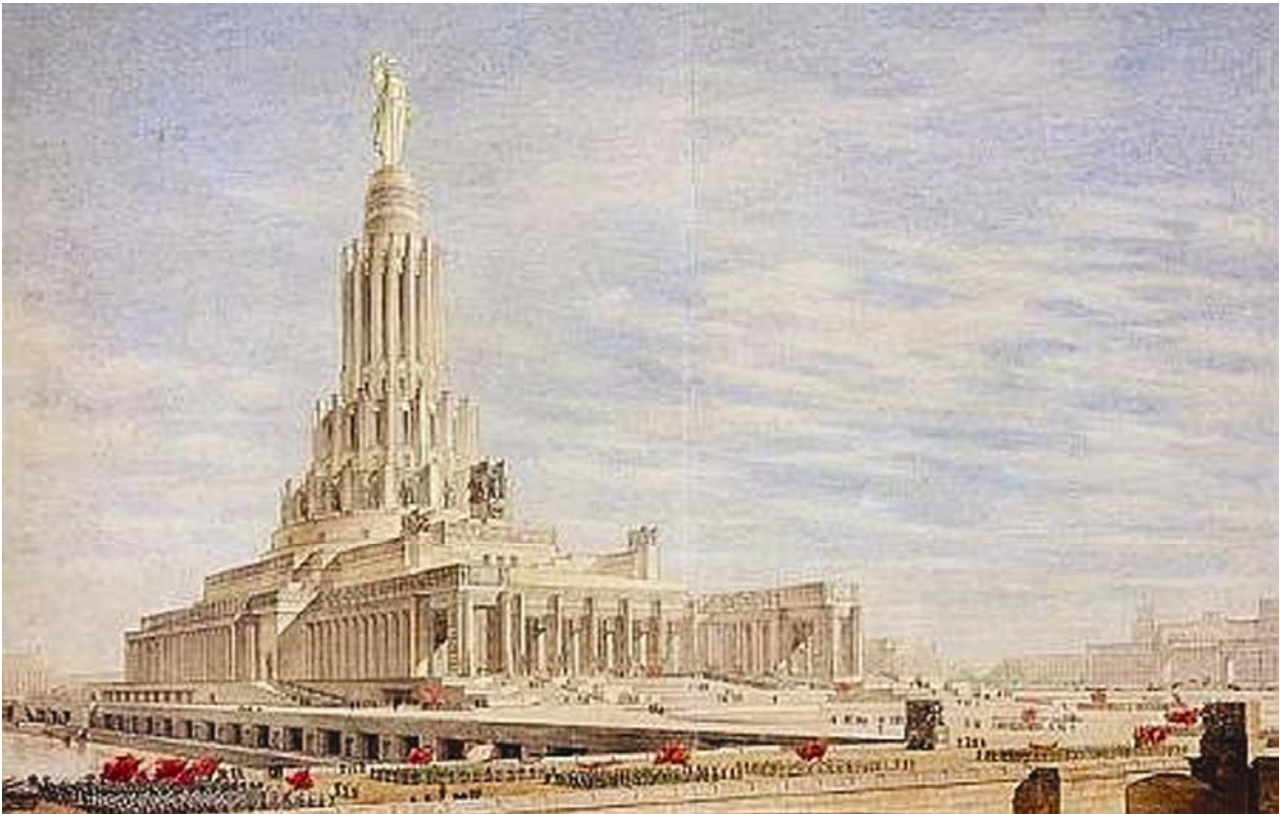


Figure 3 Iofan-Schuko-Gelfreikh, The Palace of the Soviets Finalised Concept 1934

Fast forward to the early 20th Century and we cross paths with the greatest Mega, or in this case, Megalo-maniac of modern times, Joseph Vissarionovich Dzughashvili, better known by his adopted name, Joseph Stalin (which meant Man of Steel). “Uncle Joe’s” vision also featured Mega buildings and his efforts reflected an insatiable appetite for super sized initiatives. Perhaps the most well known built product of the Stalin era, are the Seven Summits or Seven Sisters, which ring Moscow, combining Russia Baroque and Gothic Styles with oversized Soviet statuary. In a “Stalinist” way, (a word now used to describe the worst characteristics of the built environment) these Seven Sisters combined Vision + Mega at a given moment in time but lacked Synchronicity. The height and the enormity of these buildings was not limited by political will but by a lack of knowledge, intellect and experience. The structures were far heavier than American structures of the same era. All the buildings employed over-engineered steel frames with thick concrete ceilings and masonry infill, placed on an enormous concrete slab foundation, in one case, over seven meters thick.

Joseph Vissarionovich had attempted an even greater feat of Megalomania in the early 1930s. The Palace of the Soviets, in Moscow was designed by three Soviet architects, beating out Corbusier, Gropius and others in an international competition. No surprise then that the winning entry was capped with a giant statue of Vladimir Lenin and was designed to reach a lofty height

of over 400 meters; taller than the Empire State Building in New York and roughly the height of the top floor at the Sears Tower in Chicago. In fact, a popular song in 1930s Russia featured the refrain “Ever Higher” embodying Stalin’s ethos and desire to overtake American achievements.

In a quote that may seem more suggestive of recent remarks by the current leaders of developing cities in the 21st Century, Stalin stated:

“Foreigners will come to our capital city, walk around and there’s no skyscrapers. If they compare Moscow to capitalist cities, then it’s a moral blow to us”



Figure 4 Iofan-Schuko-Gelfreikh, The Palace of the Soviets 1933



Figure 5 Joseph Stalin

To proceed with this vision, Stalin demolished one of the most revered buildings in the city, The Cathedral of

Christ the Savior. Construction started on this behemoth in 1937, but was delayed by water seeping into the site from nearby rivers and was eventually terminated. Following World War II, Stalin built the largest ever open-air swimming pool on the site. In a case of Mega paranoia, the depth of the pool was limited, for most of the area, to the height of Stalin's chin, thereby ensuring that he could not drown while bathing. Stalin was a short man.



Figure 6 Modern Replacement of The Cathedral of Christ the Saviour

A final irony associated with this proposed Mega structure, is that The Cathedral of Christ the Savior was completely rebuilt during the reign of another larger than life Russian, the late Boris Yeltsin (who was laid in State there). In this case, you may wish to draw your own conclusions about: things that like to happen together in a meaningful way at a given moment in time.



Figure 7 Mega Dome 4, Proposed by R. Buckminster Fuller

Most frequently during his lifetime, he was known as a crackpot or a dreamer, but R. Buckminster Fuller or Bucky Fuller is now revered as the "first poet of technology", "a seminal thinker" and "the greatest living genius of industrial-technical realisation in building". In my view, Bucky Fuller in his built and unbuilt work captured the idea of Synchronicity. His foresight in understanding human desires combined with the demand for Mega developments embodied a fusion of humanism, capitalism and technology. The Fuller Geodesic Dome was the first step in developing and delivering a Vision that supports the notion that: things that like to happen

together in a meaningful way at a given moment in time.

R. Buckminster Fuller clearly anticipating that density, height, scale and mixed-use were an inevitability. To address this visionary understanding of our future, Bucky proposed megastructures. One scheme called for two-mile-diameter spheres of 5000 inhabitants, moored or floating freely in the air. (At about one-half mile in diameter, geodesic spheres are lighter than the air they contain, and so will float like helium balloons.

Bucky also called for enormous transparent domes over entire cities. He designed and proposed such a dome that would cover the entire area of Mid-Town Manhattan. So thorough was his fusion of humanism, capitalism and technology that he calculated savings from snow removal costs, thermal efficiency and improved air quality would easily pay for the Mega dome R. Buckminster Fuller took his Vision, added Mega technology and aligned his thinking with events that have now in the 21st Century conspired to drive the current outcome.

So, how do we develop "the cult of a higher life" as aspired to by Mr. Louis H. Sullivan in 1896 and Mr Fuller in the late 20th Century?

The genesis for outstanding tall buildings in the 21st Century "the cult of a higher life" must be derived from several critical criteria and a rigorous understanding of their importance. All are of equal value and must be balanced in a composition that creates an inspirational development of lasting quality and value in the built environment.

Sustainability is perhaps the key criteria in the development and design of a tall workplace building. A simple, yet rarely employed, design driver is the orientation of the building as it relates to sun, wind and environmental conditions. The 20th Century paradigm is simply to extrude the plan form vertically, uniformly and without consideration for the enormous potential that the massing of a tall building offers. In addition, the standard solution for nearly 100 years has been to uniformly clad façade and/or envelope the building in the same configuration on all four compass points. It is an obvious step in the creative process to utilise orientation to offer unique and even sculpted to the office building. The vision must be to create designs that offer a specific strategy for the lifecycle costing and operations of major residential, hospitality, workplace and mixed use office buildings.

City Central seeks to address 'sick building syndrome', ventilation rates are 100% greater than the Australian standard. 100% of air supply is fresh, outside air. Carpets, adhesives, sealants and composite wood products have been selected to minimize off-gassing. In addition, removal of indoor pollutants from printing and photocopy areas is managed through a dedicated tenant exhaust riser. The building also achieves a reduction of CO₂ emissions equivalent to approximately 50% over existing building stock. Tower 1 includes AAAA rated WC's, waterless urinals and taps with a flow restrictor achieving 2L/min. Separate water meters are fixed on major uses and linked to the BMS for leak detection, and the cooling tower

designed for 6 cycles of concentration. Adelaide City Central is a speculative building with over 30% of the NLA delivered as shell-and-core for subsequent fitout: structural steel has a recycled post consumer content of 80%. Provision is made for segregation facilities for recycling office waste within tenancies. Tower 1 uses refrigerants and thermal insulation with Ozone Depleting Potential (ODP) of zero.



Figure 8 City Central, Architects Woods Bagot

Figure 9 City Central, Architects Woods Bagot

Trends in Lifestyle and the Workplace indicate that the move towards open plan, flexible space and alternative working patterns will continue. Designing space which enhances the ability of an organisation to flourish will continue to remain a significant challenge resulting from a change from process driven toil toward the growing emphasis on knowledge work. Peter Drucker, an American economist, first identified knowledge workers: staff or employees whose primary focus transcends simple production. The traditional office building is being radically challenged by the rise of wireless technologies and new ways of working. This applies to applications in all tall building typologies. It really is about choice and the issue of choice as it affects floor plates and ultimately office and tall building design cannot be overstated. Another unavoidable demand that these buildings will need to embrace is the phenomenon of an ageing population in the Western World which is dramatically apparent.

For example, Liverpool Central, with its mix of leisure and destination retail spaces from the compact to

the commanding. Its luxury apartments, cutting edge facilities, high-star 157 bed hotel and direct link to Central Station through which 35,000 passengers pass every day. Central Village provides unparalleled opportunities.

Large areas of public realm, designed by Woods Bagot, including a stepped water race and a light bridge across the waterway into a new square. Impressive, imaginative, immediate.



Figure 10 Liverpool Central, Architects Woods Bagot



Figure 11 Liverpool Central, Architects Woods Bagot

Technology will be the greatest “informant” of our living space and workplace office building design in the early part of the 21st Century. This relates not only to the work patterns and habits of the growing knowledge worker population, but more specifically to the advances in building technology and design. The performance of building facades, the development of high-speed and selective lifting and people moving systems and the rapid advances in communications technology are the key drivers in the composition of physical space defining workspace and tall office building design. In particular, there is a focus on optics and other communication systems. Technology is not a panacea to answer the personal space “demands” of the Resident, Guest or Knowledge Worker. Daylight, Sunlight, Air Control and a range of other environmental criteria will also need to be addressed in the design of the future workplace and living space. And there is the basic enemy of very tall buildings; Wind! Wind Load; as articulated by Lynn S. Beedle, Mir M. Ali and Paul J. Armstrong in their book: *The Skyscraper and the City, Design, Technology and Innovation* indicates that the “Structural design of most

tall buildings is controlled by wind effect”

An example of a simple but progressive use of materials and technology is the “thermal chimney” at the Southern Cross Corporate Centre.



Figure 12 Southern Cross Architect Woods Bagot



Figure 13 Shenzhen Residential Towers, China. Architect, Woods Bagot

Figure 14 Piccadilly Central Tower, Manchester, Architect: Woods Bagot

Market driven criteria are those indices which drive the concentration and density of tall office buildings in particular. The notion of consolidation and adjacency continues to generate tall buildings and concentrated clusters for a variety of corporations and organisations. Peter Wynne Rees, the long time Head of Planning for the City Corporation of London, repeatedly emphasises the benefits of serendipity in “The City”, which is the world capital for international finance. In terms of tall residential and hospitality buildings, the market is telling us “mixed use”, “placemaking” and “community” become the by-lines and key drivers.

After his many years guiding the urban design of this unique place which now includes skyscrapers and ground scrapers, Mr Rees insists “that the proximity of a range of financial services companies, their staff, experts and customers creates a conversation; a dialogue on the streets, in the pubs, bars and restaurants, which underpins the strength of the centre of the world for international finance”. Understanding this phenomenon and how the dynamics of the urban environment mixed in a cocktail of

various business concerns and lifestyle choices is vital to creating a workplace community in a tall building.

In Europe, the phenomenon of brownfield regeneration resulting in vibrant and animated new communities has been realised through the market demand for mixed use/lifestyle developments.



Figure 15 Piccadilly Central Tower, Manchester.

Architect Woods Bagot

Urban Design and Architecture now have common definitions, however, the words Urban and Design, were first co joined as an idea, a discipline, a practice in the late 1950s. Visionaries at this time such as Jane Jacobs, Edmund Bacon and William Holly Whyte revealed through their study and insight the importance of “the space between” ever increasing densities and height of our cities. They also “exposed” something Holly Whyte published as “The Social Life of (Small) Urban Spaces”. Their work spoke to the way in which, simple terms, office workers, knowledge workers and the denizens of the urban environment utilise space and the complex dynamics which relate to urban design; an ongoing study which must rigorously be understood to inform our design consciousness.

The architecture of the tall building as opportunity to identify both Space and Time might best be captured in the Chrysler Building in Manhattan. The romance, glamour and soaring exuberance of this composition masks the reality of a standard office floor plate extruded skyward for over three quarters of its height.



Figure 16 Chrysler Building, Manhattan, NYC

Perhaps now other 19th Century tall office buildings offer such a compelling vision of what we now embrace; an

iconic shape which manifests the brand, the corporation associated with its birth and delivery. For this address in Manhattan, Chrysler is still the moniker, and beauty, style and cutting edge are still the adjectives associated with the 77-year-old high rise. The building's eternal imprimatur, taken from Mr. W.P. Chrysler, outlives the remarkable architect who designed it, William Van Alen (who later suffered at the hands of the client), and the fact that the automobile company has not owned the structure for many decades.



Figure 12 The Gap Building. Architect Woods Bagot

Only by employing an intellectual process, that keeps these “five plates” spinning at once, can a design solution exceed the expectations embedded in these international experiences to inform buildings of this nature, which have enormous impact on our urban environment. The knowledge the world offers in the development and design of tall office buildings is like a very large book; to exclusively utilise local applications only is like reading a single page. The marriage of urban context and the responsibility a tall building carries in relation to place making and way finding, should provide residents and users with a clear and unambiguous message.

A final example of aspiration as the form giving driver is 30 St. Mary's Axe in London. The developer Swiss Re was the driving force behind Foster & Partner's unique design. As far as Swiss Re were concerned the goal was to create a true international icon that would represent their company's brand and enhance their global profile (Lord Sir Norman Foster and Mr. Ken Shuttleworth, perhaps had other aspirations in mind such as sustainability, spatial quality, flexibility and pushing the limits of technology). The building has changed hands in the last several months and the Swiss Re

insurance company branded property is now part of the portfolio of a mega German property company. This remarkable building, once commonly known as the Swiss Re Tower, is now firmly and indelibly, as named by the London Black Cab driver; the Gherkin.

Late last year, 30 St. Mary's Axe also achieved the highest London, per floor, rental in a decade, which will be paid by a US Law firm. This, after several years in which a common market perception and “expert” development advice opined that an “oddly shaped” building with arbitrary phallic shape was “inappropriate for a serious business occupier”.

So, as a current reference, the Gherkin has come good in its own right and the notion of a building whose geometry and expression is not a pure extrusion of the best lease depth is severely compromised.

The lesson is that *Aspiration* fused with Technology will be the imprimatur of tall buildings in these early days of the 21st Century.

The results of these observations and historic events in relation to Tall Building Design Intelligence, point to the following conclusions:

Sustainability; pushing the limits of Technology and fully embracing the Life Cycle implications of a project will be a basic rudiment of Tall Building Design Intelligence going forward.

Placemaking; the results of late 20th and early 21st century urban design indicate that rigour and analysis are required in the pursuit of sustainable place-making. The insights of Edmund N. Bacon in his seminal work *Design of Cities*, provides the basic tenants for achieving urban spaces which actively contribute to the built environment. In addition, the notion of pathological research merged with the natural characteristics of any site as pioneered by Ian. L. McHarg, in his book, *Design With Nature* will become integral in Tall Building Design.

Conclusion

The final conclusion resulting from these exemplars, is that, the statement tall buildings of the future will make, will transcend the 20th Century traditions and stereotypes of this building typology. In the same way that the profile, habits and characteristics of end users evolves, so too must the function, anatomy and yes, the physical form of the tall building of the future.

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