Sustainability in Brazil:

A report on the Brazil GreenBuilding Conference, São Paulo September 1-3, 2010

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The Brazilian Building Boom

From September 1 to 3 this year, GBC Brazil held its first GreenBuilding conference in São Paulo. This was an impressive feat, as Brazil GBC only came into existence 3 years ago. Since then, 18 buildings have become LEED certified in Brazil, with over 180 more currently registered. The chapter currently enjoys a membership base of 370 companies.

The GreenBuilding Brazil conference was held as Brazil gears up to host the 2012 Rio +20 Earth Summit, the World Cup in 2014 and the Olympics in 2016. All three of these events are giving a major boost to green building in the region: the Brazilian Olympic Committee (COB) is requiring LEED certification for their building projects and the Brazilian Football Federation (CBF) has promised that 2014 will be the first "Green World Cup". The Brazilian Development Bank (BNDES) stands behind that promise, having made available up to $400 million in financing for each stadium, depending upon compliance with the sustainability requirements of the Ministry of Sports. Brazil GBC is working closely with World Cup organizers.

These events are also precipitating a boom in infrastructure projects. Most major cities (such as Rio, São Paulo, and Salvador) have ambitious mass transit projects underway, backed in part by the federal "Growth Acceleration Program". FIFA's desire for direct mass transit service between each venue stadium and the local airport is stimulating new airport-linked ground transit systems throughout the country.

This Green Building Trifecta is happening against the background of a housing boom fueled, in the private sector, by astonishing economic growth (9% for the first quarter of 2010) and easier access to

credit. In the public sector, the Federal Government's "My House, My Life" project is designed to stimulate the building of affordable homes, with the aim to end Brazil's housing shortage and supplant the inadequate shelter of the favelas.

In other words, the Brazilian civil construction industry is ablaze, currently responsible for 9.2% of the GDP. Welcome as it is, this growth has serious environmental implications: similar to statistics for the US, buildings are responsible for 42% of the Brazil's energy consumption and 35% of GHG emissions. This is startling, given that due to the warm climate, heating loads are negligible, while air conditioning is still a luxury.

Per the World Nuclear Association, in 2007, 84% of the country's electrical power came from hydroelectric sources. Another 3.5% comes from gas, 4% from biomass, about 5% from coal and oil, and 3% from nuclear. Despite the use of ethanol and part-ethanol fuels, greenhouse gas emissions and particulate pollution from vehicles and industry are high.

I asked Thanassee Wanick, a founder of Brazil GBC, the Thai Consul in São Paulo, and a passionate advocate for sustainable design. "Where does all the carbon created by buildings in Brasil come from?"

"Waste. In the construction industry from 30 to 50% of raw materials are wasted." This is partially due to a construction process where the architects and the engineers have little communication. In the typical Brazilian construction process, the Civil Engineering firm leads the project team, with the architect having more control over space planning and interior design that the overall building and often being consulted only after the main structure is built. "Most countries with cheap labor waste labor", she added.

This didn't address the question of GHG emission as much as it revealed the importance that LEED and other sustainability certification programs might have in modernizing Brazil's construction practice, by bringing integrated design, better communication, tracking tools and accountability into the process.

Thassanee Wanick also initiated the "One Degree Less" project, which has spread internationally. The movement promotes the use of white roofing materials and retrofit coatings to cool down buildings and combat the urban heat island effect.

The conference, held at the Fécomercio conference center, began with the International Congress. There were a handful of participants from the US, Mexico, Japan, the Netherlands, England, Thailand, South Korea, Argentina and Spain, but the vast majority of 900attendees were Brazilian: many from the state of São Paulo. In addition 59 speakers, about 80 exhibitors and 38 sponsoring firms participated.

The morning session presented Brazil's varied Green development programs to the exterior. GBC Brazil CEO, Nelson Kawakami, summarizing the state of sustainable building in Brazil. Eduardo Jorge, Secretary of "Green" and the Environment for the City of São Paulo presented some of the host city's green initiatives. São Paulo has passed legislation to reach the goal of a 30% reduction in GHG emissions by 2012 compared to 2005 levels. Other new programs will increase much-needed, urban green space, and protect water and watershed areas. Water pollution is a critical issue in São Paulo, where heavy industrialization, leakage form septic tank systems and unregulated sewage flowing from the favelas have turned the rivers that define the city into canals of noxious fluid. A project to restore the Tietê as a living river project has been ongoing since the early 1990s.

The most eagerly awaited presentation featured the current explosion of opportunities and innovation in Rio de Janeiro. Márcio Santa Rosa, director of the Sustainable Construction Network in Rio, coordinated the Environmental Management and Sustainability Plan for Rio's winning Olympic bid, and is currently creating the sustainability guidelines for the Brazil Olympic Committee's (COB) RFPs. One of the IOC's requirements for the 2016 Olympics was a guarantee that this would be a "Green Olympics". The principal new structures and grounds, such as the sports venues and athletes' residential villages, are required to be LEED certified. Associated projects being built by the City of Rio do not yet have this requirement, but some similar parameter is being discussed.

To support the Olympics, the Cup , and general growth, starting this year, $120 billion dollars is being spent to update Rio's infrastructure. Transit is targeted, with an extension to Rio's metro already underway, including a line to the burgeoning seaside suburb of Barra de Tijuca, where the Olympic Village will be located and nearly half of the events will take place. The transit, air and water quality improvements implied in this work make them a true part of greening the city.

The most thrilling single project for fans of Rio's gracious and historic downtown is Porto Maravilha , which will redevelop approximately 1 -1/2 square miles of the downtown dockside district for residential and commercial purposes. Following the precedent of cities such as Boston, Rio will remove the

elevated roadway that, for generations has divided the city from the Baia de Guanabara. Some portion of the area may be realized as a LEED ND project.

Two exquisite new museums will grace the city's iconic waterfront, the zoomy Museu da Imagem e do Som (Museum of Image and Sound), by Diller, Scofidio + Renfro in Copacabana and the Museu de Amanhá (The Museum of Tomorrow) by Santiago Calatrava, on the Pier of Maua, which will be the crown of the Porto Maravilha project. The Museum of the future will be, according to Calatrava, " a living museum and pedagogical tool" for teaching the concepts of sustainable development. The project will be completely self-sustained, generating its own power from a moving photovoltaic array and using sea water as coolant. The museum will house exhibitions dedicated to possibilities for the future, especially environmentally friendly technologies.

Finally, there will be a new, high speed rail service from Rio to São Paulo, with current completion scheduled for 2015.

Important International GBC business was conducted at the event. USGBC Senior Vice President for LEED, Scott Horst, announced the formation of an International Roundtable to address project certification issues affecting international members. Twenty eight national councils will participate in the 18 seat Roundtable, at which Brazil, along with the other BRIC countries, will hold permanent places. GBC Brazil and the USGBC signed a Memorandum of Understanding that formalized both as the first participants.

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When Brandon Haws of Foster & Partners Architecture was forced to cancel his appearance, Environmental Consultant KlausBode, who had been project engineer on Foster's Commerzbank project, graciously stepped in. Bode is a faculty member at the Architectural Association Graduate School in London and founding partner of the London-based BDSP Partnership of Environmental Engineers. He and partner Sandro Tubertini, who recently established BDSP Partnership in Brazil, used their varied international projects as a platform to argue for more meaningful measurement of building system performance and claims of sustainability.

Bode's wife and fellow AA faculty member , Joana Gonçalves, was also in town to launch her book The Environmental Performance of Tall Buildings, which poses the hard question, regardless of certification, is it ever possible for high-rise buildings to be truly sustainable?

Afternoon Sessions

Lair Krahenbuhl, president of CDHU and Secretary of Housing for the State of São Paulo opened the afternoon with a detailed brief on the social and environmental aspects of his agency's projects. Due to the sheer scale of the work (620 communities), he referred to it as a potential "game-changer" for sustainable building.

These projects will providing a better housing product for São Paulo's working poor, but just as important is supporting new residents, some of whom have only lived in simple shelters in the favelas, with manuals, instructions and programs to help them get full benefit from this public investment in sustainable building.

The tech-y highlight of the afternoon occurred when Kent Petterson, former president of ASHRAE, was presented with a copy of ASHRAE Standard 189.1, newly translated Portuguese. For those deep in the trenches of LEED certification, this was an important step in opening the doors to broader Brazilian professional participation in LEED, the first fruit of a partnership between ASHRAE and GBC Brazil.

Coffee breaks were held in the exhibit hall; an excellent opportunity to chat and sip the strong, mellow Brazilian brew. Among the booths, there were many developers and consultants. The product offering was small, but according to Saulo Rozendo, LEED AP, currently working with Dow Corning in the USA, the selection of products that have the certifications and characteristics needed for specific LEED credits has grown since 2008, and it is now easier to find compliant products, though many are imported.

The many government planning and housing professionals spoke about LEED for Neighborhood Development. They were hopeful that LEED ND might serve as a framework to resolve Brazil's environmental concerns while addressing social issues such as housing, infrastructure, safety, social equity. Unfortunately, no educational sessions addressed it.

After the break, Paolo Freire, Brazilian VP of Johnson Controls, presented the Empire State Building LEED EBOM project. While there are many Brazilian projects registered for LEED-NC, -CS, -CI and -ND, there is

little activity in the hottest LEED version in the US, EBOM – Existing Buildings Operation and Maintenance. Brazil has great retrofit potential and high electricity prices produce much shorter payback periods for efficiency upgrades than in the States – often well under ten years. However, despite building stock reaching back to the 1600s, the Brazilian market generally prefers new buildings.

Day Two – Educational Sessions

Water management is a critical issue in urban Brazil. Annual rain fall is high over the more populated coastal areas. However, pollution of freshwater bodies, groundwater and oceans is rampant due to sewage and industrial waste. In rural areas, local water may be polluted by agriculture or mining, and clean drinking water is not always available.

A large portion of the population lives in informal urbanized areas, with no sewage or storm drain infrastructure. Besides causing pollution, these areas suffer from heavy annual flooding, which destroys homes and takes lives. Even iconic Copacabana has appeared in the news with patrons wading through hip-deep water to get to their favorite bar.

So, Thursday morning, confronted with four fully booked lecture halls on Sustainable Sites, Energy Efficiency, Interior Environmental Quality and Rational Use of Water, I dove into the latter. The sessions covered metering, low water use fixtures, technology to monitor and reduce water use, grey and black water reuse and water policy education in the schools.

Wilson Passeto, director of the Agua e Cidade program, is a strong advocate of public policy in defense of the universal right to potable water. Our built environment, he contends, reflects and creates expectations about citizenship, empowerment and change. Good water policy must reformulate attitudes towards consumption of water and the value of keeping water bodies clean. It must address demand and supply, land use and urban waste disposal.

Passeto delivers this important message through young people in school, who bring their enthusiasm about water stewardship home to busy adults. The “Water in the School” program that his organization developed uses comic books mixed with serious messages about conservation and protection of water.

Virginia Sodré, Director of commercial technology for Infintytech, provided a clear and detailed analysis of four different non-potable water source technologies: collection and use of rainwater, treatment and

re-use of condensation water, grey water and black water, and criteria to decide which may be appropriate for a given project.

Missing in this session was a discussion of large public water management projects, such as that being carried out over the last 15 years on the Tiete River, the many constructed wetlands projects around the country, or the successful water treatment efforts in Salvador, Bahia in the north.

That afternoon, one of the lecture halls was dedicated to environmental seals, labeling and certification. I was curious to see if a Brazilian standard was being developed that might eventually be accepted by the USGBC as third party verification for criteria such as low VOC or formaldehyde content. The standard LEED recognized rating systems, such as Green Seal and Floor Score, did not have a presence in this forum. A representative of the UL Environment standards system, launched in January of 2009, was present to discuss that system, but it is not yet mentioned in the LEED reference guides.

A national product certification system was presented, the Ecological Seal program of the Falcão Bauer Quality Institute. Ecological Seal is an outgrowth of the Institute's original role in product quality certification, focusing on benign ingredients, minimal environmental impact, material recycling and social commitment by manufacturers.

There is a heartening emphasis on social justice in all of the Brazilian rating and certification systems – a issue referenced by the USGBC but not addressed in the LEED rating systems, excepting ND. For example, the sustainable building and management firm, Sustentax, explicitly cites "bettering the quality of life" and "the inclusion of marginalized persons" in its mission statement._

While large and internationally financed sustainable projects in Brazil strive for LEED certification, another interesting certification option has arisen: AQUA, (Portuguese acronym for High Environmental Quality) based on France's HQE certification program. The Brazilian version of this certification system was developed and is supported by the Vanzolini Foundation, based at the University of São Paulo. The Vanzolini Foundation is a member of the Sustainable Building Alliance.

The goals and benefits of this program are similar to LEED, but the road to certification is different. Each project must meet a minimum of "good" rating in 14 categories, within 4 areas classified as Eco-construction, Eco-management, Comfort and Health. Acoustic comfort is a major category in this system, which reflects a general concern in Brazil.

Certification is carried out in 3 steps parallel with the Design, Construction and Operation of the project. Each phase is initially self-verified by the project team, with a subsequent site visit by the Vanzolini Foundation. 14 projects have been certified in AQUA, including office, school and multi-family residential buildings.

"Procel Edifica" is a federal initiative, through Electrobras and the Ministry of Mines and Energy, to label buildings according to their energy efficiency and assemble an energy use database. Similar in intent to Energy Star building benchmarking in the USA, efficiency in building envelope design, illumination, and air conditioning are rated against standard benchmarks by building type and given a grade.

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There is an old, ironic, self-deprecating joke among Brazilians: "Brazil will always be the country of the future". Today the nation might be outgrowing the joke and risk becoming the country of the present.

The overwhelming impression from GreenBuilding Brazil is that of an urgent mission to reverse the degradation of the environment. While the outside world points fingers at Brazil for its inability to halt destruction of the Amazonian, a problem with many political and economic causes, most Brazilians seem fiercely connected to nature, and want to protect and restore the environment. There are many competent designers, engineers, builders and public servants of good will, attuned to the currents of the world. On the other side, there is the weight of the past: a cynicism born of years of corrupt government, oligarchy, the recent history of military dictatorship and the much older shadows of slavery and colonial domination. That past will get in the way time and time again, skewing construction contracts, moving projects away from the competent in favor of the connected, but I do think that the Brazil that is creating itself right now will emerge as a leader in sustainability.

In this context, sustainability certification programs not only protect the environment, they also offer a meaningful tool to control, quantify and assign accountability in the building process. They provide ground rules for communication and demand that all stakeholders come together in planning. They require commissioning and third party verification. This makes sustainability certification a welcome ally in the ongoing movement towards transparency and democracy in development.