Case Study: K11 Art Mall

Case Study 2: K11 Art Mall

Background

- Name: K11 Art Mall
- Location: Shanghai, China
- Category: Commercial Building/Shopping Mall
- Architects: Kokai Studios
- Local Architects Tong Ji Architecture Design Research Institute
- Area: 35,500 m2
- Project Completed: 2013
- LEED Consultant: ARUP
- Landscape Design: Hassell
- Façade Consultant: KWP & SEELE
- Water Feature: Harmonic Environments Inc.
- MEP Consultants: AECOM
- Client: New World Development

It is important to note that this case study only considers the shopping mall that includes three stories below ground level and five stories above ground level plus the roof. There is a tower included in this building that rises to 61 stories above ground level, and the tower will be discussed only in the background section of the case study. The architectural greenery of the five floors of the shopping mall during its refurbishment will be the focus of the design, results and other points of interest sections.

Located in the center of Shanghai's commercial shopping street, Huai Hai Lu in Huangpu District, stands the landmark New World Tower, which is one of the leading symbols of the 1990s commercial renaissance of Shanghai. The renovation that was completed in 2013 covered eight floors of the shopping mall and included several architectural greenery applications. The original design of the shopping mall was created by Bregman and Hamann Architects, however due to a desire to have the shopping mall meet LEED Gold Certification standards, the renovation was undertaken. The architects from Kokai Studios worked in conjunction with K11 to develop the perfect integration of art appreciation, humanistic experience, naturalness and environmental protection coupled with a grand shopping experience with the purpose to combine urban lifestyle with the natural world. In order to guide the refurbishment process, K11 developed a sustainability policy that has several key components which construct the theoretical framework so that the practical methods of the refurbishment and outcomes of the new building would align with K11's goals. K11's sustainability policy was developed in order to create a new way of living so that future generations can enjoy the same quality of life that people experience today. Another aspect of the sustainability policy outlines the commitments K11 makes, believing that they are not just a company but a group of people intent on making the future better for everyone. In order to achieve this vision K11 planned to comply with applicable laws and regulations relating to issues of sustainability and seek internationally accepted best practice guidelines. They planned

to minimize the environmental impact of the project through responsible practice. They also planned to keep communication with their investors and stakeholders about their sustainability performance and focus on improvement wherever possible. They also committed to revitalizing their neighboring communities and promote green concepts for sustainable living to increase the positive impact of their presence. They made a commitment to foster a green, healthy, safe, and caring workplace for their employees by promoting environmental protection, energy savings, and social contribution. The promised to encourage their business partners to be aware and act on issues of sustainable development. And finally, the planned to impress on their employees the importance of their sustainability policy and make it readily available to their stakeholders and investors. The main challenges for this refurbishment project were about the best possible ways to get a 10-year-old building into LEED-CS 2009 Gold Standard. In order to meet the requirements for the LEED Certification the 10-year-old HVAC system had to be removed and replaced with a much more efficient system, and the 4.2m floor-to-floor height needed to be reduced to 3.0m net height by installing an insulated suspended ceiling in order to reduce the workload of the HVAC system. These requirements are a small sample of the LEED Gold Certification requirements, but the others will be discussed in greater detail in the following sections.

Design

The K11 project brought into reality their core brand values of ‘Art, People and Nature’ in a variety of different ways. The shopping mall was drastically reconfigured into a imaginative sequence of experiences and places, circling around the central outdoor courtyard, described as a journey of imagination’ where common, public areas are combined with art display areas, futuristic features contrasted with natural elements and living materials. Washed in natural light through the glass floor of the basement 2 atrium, integrates urban living with organic elements. The visual integration through the mall is achieved through the atrium and its glass floor which is accessible from above with a 280 m2 free-form glass skylight. The original design required specialized software for its engineering, geometric control, and positioning during its construction and its custom-made mullions designed for maximum light transmission. The inner courtyard of the mall features a nine-story waterfall which, at the time of construction was the largest outdoor waterfall in Asia, which runs on an automatic inductor system where water consumption is regulated depending on the climactic conditions of the environment. There are over 2000 m2 of wall space covered by a living wall system that functions as a rainwater collecting system whereby the collected water is used in other parts of the building, including the cooling system. The shopping mall’s canteen on the third and fourth floors surround an urban farm which supplies some of the vendors with fresh produce, as well as providing direct access to the roof garden which is a converted parking lot. The farm uses soil free farming methods, automatic irrigation systems, and LED lighting that supplements the ample daylight present in the building. In basement three there are private art galleries that surround an event space that is integrated with a permanent collection that is owned by K11. The event space is busy with openings, activities, lectures, design competitions, and exhibitions that seek active participation from the community and has been very successful since the opening of the mall. The podium facades were renovated, over 9000 m2 was converted, and the design inspiration comes from the dichotomy of the conflicting needs of innovation and conservation, and is demonstrated through the respect shown for the historical heritage of Huaihai Lu and the New World Tower’s original design, demanding high visibility of K11 and its residents. As stated above, K11’s design inspiration is committed to offering client’s shopping experience with natural spaces and

sustainable development and they have done so through the incorporation of the multidimensional landscapes, roof garden, vertical greenery, and urban farming. In order to meet LEED Gold Standard requirements ARUP set up four major requirements that K11 had to fulfill before being awarded the certification. The first was to reuse the structural frame from the existing construction by over a 95% threshold in order to reduce construction waste and resource demand. The second requirement was that a high-performance façade had to be installed with Low-e Laminated Glass, a high air tightness rating, and to add a skylight to the atrium. The third requirement had to do with high quality interior spaces, namely to increase the ventilation rate and to use low-VOC materials for renovated spaces. The fourth requirement involved a serious upgrade to of electrical and mechanical equipment in the building. These upgrades included: upgrading the air handing unit for the whole building; installing a CO2 demand control ventilation system; installing high-efficiency lighting; including air side heat recovery; water side of free cooling by cooling tower; installing a hot water secondary loop variable speed pump and; adding a variable speed control of the cooling tower.

Results

The main objective result of the success of this project were the awarding of the Core and Shell LEED Gold Certification for Existing Buildings as well as the highly sought-after Asia Pacific Property Awards 2013 in Commercial Renovation Redevelopment Category. These two awards clearly demonstrate K11's drive and ability to stay with their core principles outlined in their Sustainability Policy. The community outreach that K11 has done to foster good relations with the residents, workers and clients of the building is also very apparent through the event space that was created, as well as the urban farm. The farm rotates its crop source depending on the season which shows active consideration towards environmental factors that control our lives. Community outreach is also done with the farm by providing classes on how to set up an herb or vegetable garden designed for apartment use. the roof on the ground level floor and on the fifth floor that borders the walkway on the sides of the roof, seems to be an intensive green roof as there are no publicly available drawings at the time of this writing. The façade seems to be a Laminar solution, possibly with felt pockets planted with a variety of grasses and plants of different colors that make a wave pattern of undulating lines that forms a camouflage design that contrasts nicely with the straight vertical structure of the façade below and above. This contrast fits nicely with the artistic ideals of the building being a marriage of the modern world and the natural world. The facade forms a belt around the courtyard highlights the upper end of the mall, making a clear division between the commercial area below and the residential and office spaces above. There are several 'green windows' (the green rectangular vegetative displays) on at least two sides of the outside building highlighting the entrances and drawing the eyes of passersby giving these casual pedestrians a clue as to the greenery found inside. When these pedestrians do enter the building, they are met with four windows of similar design, fronted with an artistic panel metal butterfly.

Other Points of Interest

By using green façade elements additional benefits might be gathered, such as a cooling effect for the courtyard and the rooms behind the facades due to the shade that the facades provide, as well as the evapotranspiration affect that is inherent in plant life. For the yard the greenery reflects less solar radiation than normal glazed facades, that results in a reduction in heat both in the air and on the ground. The roof will also support a cooling effect, especially towards the

urban heat island effect of the surrounding area, that was mentioned as one of the goals of the renovation, which therefore proves that a cooling process is happening. The several applications of architectural greenery, according to this author's research, will have a positive influence on the air quality of the surrounding area, a reduction in stormwater runoff that eases the impact of heavy rainfall on the sewage system, and also provides a relaxing and calming atmosphere to the shoppers, residents, and other visitors who wish to enjoy the space.