



# OpenBIM is Taking a Big Leap Forward in Korea

KPX Design Competition Winner by Heerim Architects and Planners Co., Ltd.

*OpenBIM adoption is progressing rapidly in Korea. OpenBIM practices are gaining ground in day-to-day project work, and BIM guidelines and requirements are being developed with ambitious, wide spread and systematic national application in mind.*

## BIM Adoption and Guidelines in Korea

buildingSMART Korea and Yonsei University survey BIM adoption in Korea bi-annually. The two most recent surveys were conducted in 2008 and 2010. The results of the latter survey show that the number of BIM projects carried out by contractors and architects increased over 100% during the two year period. Also, the number of personnel having BIM capabilities more than doubled from 2008 to 2010.

BIM is more about the process than tools. The increase in the number of companies that have BIM-related

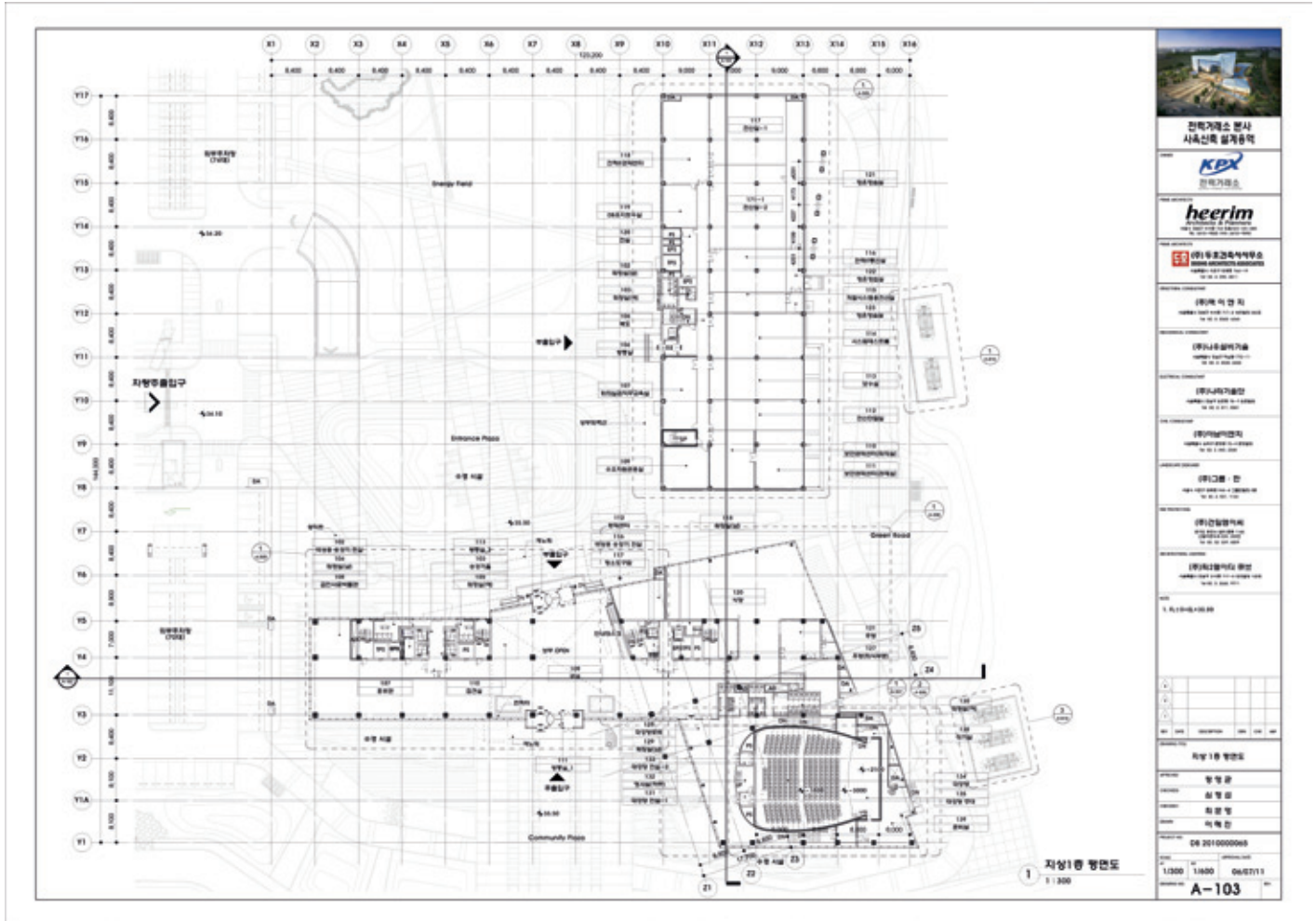
management systems increased three fold from 2008 to 2010. In terms of interoperability, almost 50% of the respondents answered that BIM projects undertaken had experienced no significant problems.

## BIM Requirements and Guidelines in Korea

OpenBIM-based BIM guidelines and design and construction projects by both government and public organizations are rapidly increasing in Korea.

These BIM initiatives and R&D projects include (for example) the National BIM Guidelines and Roadmap project, Public Procurement Service project and even individual AEC projects such as the KPX Design Competition Guidelines.

The purpose of the National BIM Guidelines and Roadmap project was to develop a national BIM roadmap and guidance in the architectural field. The project was launched by the Ministry of Land, Transport and Maritime Affairs, and it was carried out by buildingSMART Korea and Kyung Hee University in 2009. The Ministry of Land, Transport and Maritime Affairs distributed National Architectural BIM Guidance for application to four Central Administration Authorities, sixteen Metropolitan Cities and six Public Organizations on January 28th, 2010. By providing the guidance of methods to be applied, the target was to invigorate



systematic use of BIM in the public industrial market and also to set up the specific and practical standards of BIM application for each organization.

Public Procurement Service (PPS) is a professional governmental organization which executes all public procuring services including material purchases, facility construction contracts and management for the public sector in Korea. PPS is equivalent to the GSA in the US.

Public Procurement Service announced “BIM guidance for application” for the public competitions and turn-key based constructions on October 17th, 2010. BIM guidance is focusing on reducing the burden in the market resulting from new technology adoption. The goal is to define submission procedures and the scope of BIM at each design stage. PPS is also aiming at saving costs and boosting Green Construction in public area by requiring

BIM based building energy efficiency analysis, energy simulations and model based quantity takeoffs.

The long-term plan is to expand BIM into the entire public sector. Put in a very concrete way, the target is that by 2013-2015 BIM is applied on all turn-key design construction projects valued over \$50 million, and achieving savings by using 4D cost engineering systems. By 2016 the target is that BIM is used on all public projects.

### KPX Design Competition: BIM in Practice

In the Korean Power Market there are six power generation companies and several power producers producing electricity. Korea Electric Power Corporation is in charge of transmission, distribution & retail of electricity. Electricity is traded in the power market in Korea. The power market is the whole-

sale market for trading electricity produced. Korea Power Exchange (KPX) is in charge of the market operations. Korea Power Exchange is a nonprofit organization, which plays a pivotal role in South Korea's power industry by ensuring the reliability of power supply in all regions of South Korea.

The new headquarters was to be built under the motto of an energy saving and environment-friendly building with innovative design. BIM was planned to be applied to the project over all stages from design, construction, and facility management. Pushing ahead with a design project, KPX established the first ever BIM guidelines in Korea and decided to apply OpenBIM technology from the beginning of the project. KPX applied the national BIM guides by MLTM (The Ministry of Land, Transport and Maritime Affairs) and spent more than one year setting up its own BIM design guidelines, which

constituted the basis for preliminary quantified quality evaluation of models in the IFC format.

OpenBIM based model checking software was used for checking the space program, environmental friendliness and the economics of the design from the construction point of view. The primary goal was to pre-evaluate the designs and minimize subjective opinion, at the same time introducing automated, systematic and a sensible evaluation process producing quantified and objective BIM quality results. One of the participant companies stated that *“This was an innovative case, whereas the previous BIM evaluation processes have been subjective producing ambiguous BIM evaluation results.”* Solibri Model Checker was provided to every group so that the objective and reliable evaluation was guaranteed for all participants and KPX.

## Heerim Architects and Planners: the Winner of the KPX Design Competition

The six design groups which took part in the competition where Heerim Architects & Planners, Aum & Lee Architects & Associates, GNI Architects & Engineers, Hyundai Architects & Engineers Associates Co., Samwoo Architects & Engineers and Sangji Environment & Architects Space Group.

The winner of the competition was Heerim Architects and Planners Co., Ltd. The company is a publicly listed architectural and design service provider headquartered in Seoul. The company is large, even on the global scale. The 2010 World Architecture 100 published as a supplement to Building Design ranked Heerim as Number 84 in the global design community. Based on the number of design professionals, or creativity, Heerim was ranked eighth. And in the Pacific Rim, the company is number two in terms of income. The company has seen robust demand also from abroad including Abu Dhabi, Azerbaijan and Vietnam. Heerim specializes in cultural facilities, governmental, public and residential buildings, and sports stadiums. A winning proposal in a design competition where BIM quality is one criteria is a clear indication of



Heerim being a company willing to invest in the future.

## BIM and Quality Control at Heerim Architects and Planners

BIM provides design companies with clear benefits. General Manager JuYoung Lee from the BIM Research Group Architectural R&D Center at Heerim states that *“For architectural design companies, BIM makes it possible to realize high-value design such as free form structure and helps to perform high quality design by efficient information management. BIM is also utilized as an effective educational tool for the staff. By applying BIM, we could enhance the clients’ satisfaction level and keep the clear communication among the experts in each design team.”* For Heerim this means that BIM makes it easy to perform the various 3D design reviews

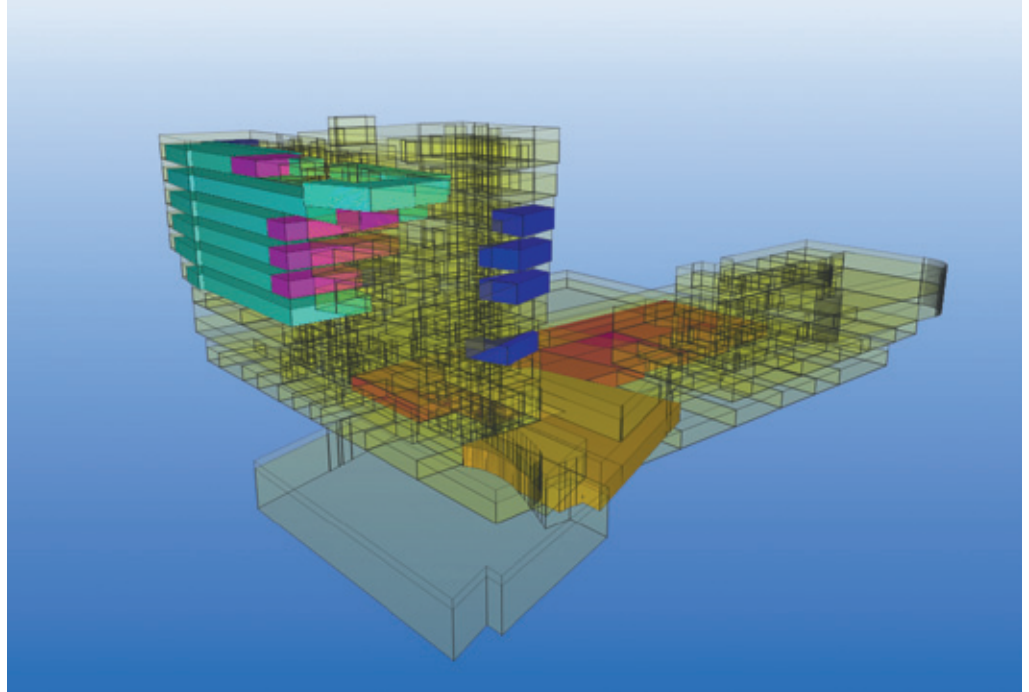
from the initial stage, and to avoid the design issues from the beginning. This minimizes the amount of design change and enables Heerim to recognize the potential issues in construction phase and set up the plans to handle them in advance. From the clients’ perspective BIM has increased the level of understanding of their building. This allowed designers to communicate clients’ demand most effectively and fast. In addition, it opened a way of getting new ideas from the clients thanks to their experience in 3D virtual space.

*“Solibri Model Checker enabled us to perform automatic checks for design and clashes between various disciplines. Above all, thanks to SMC, it was possible to integrate, evaluate and manage different data formats in the project, which enhanced overall productivity significantly. Especially, it was very impressive to experience its excellent ability of processing IFC data.”* continues JuYoung Lee. ○

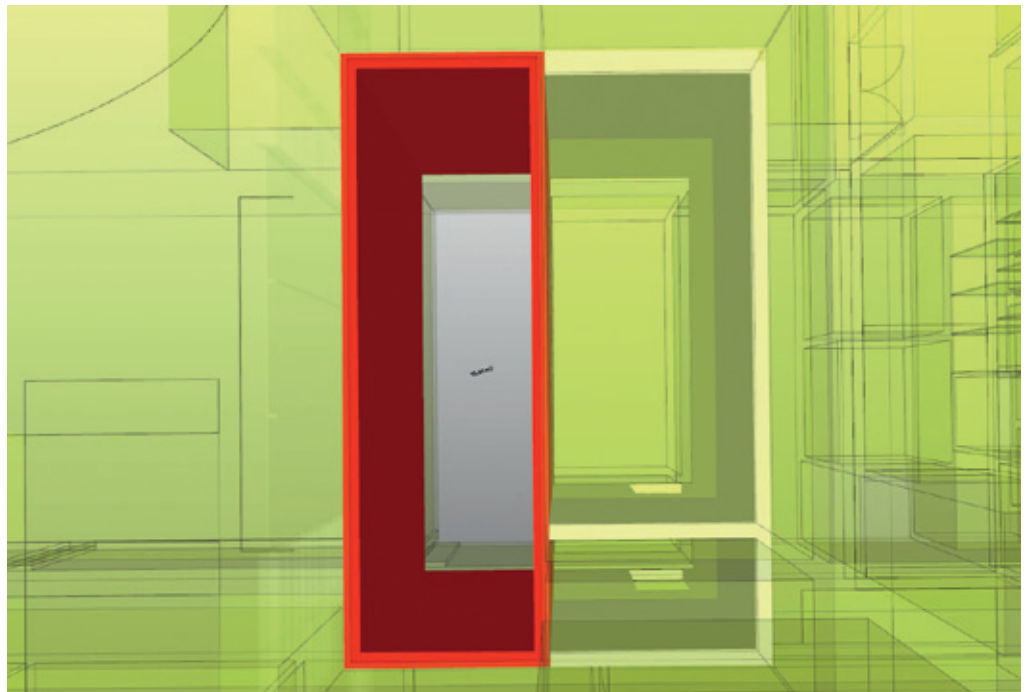
## KPX Design Competition: examples analysis

KPX design competition is significant not only in terms of introducing BIM but also for applying comprehensive OpenBIM technology and environmental friendliness analysis. Each participant group tested and coordinated their models created using various CAD authoring tools for each design discipline. While BIM model data compatibility was one of the major challenges and time consuming, each group could develop guides for themselves for quality assurance and the interoperability process.

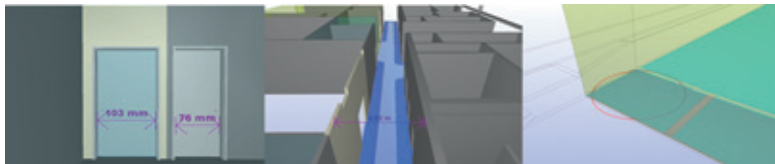
KPX Headquarters relocation design competition included two distinct stages: pre evaluation and main-evaluation. Pre evaluation was basically an evaluation of the BIM quality including, for each proposal, a valuation of spatial design in terms of space requirements, evaluation for basic BIM quality, and energy performance assessment. BIM quality was analyzed using Solibri Model Checker and rulesets based on Korean BIM Requirements, created for the design competition – a clear indication of the power of Solibri Model Checker, its capabilities in practice and flexibility in implementing BIM Requirements.



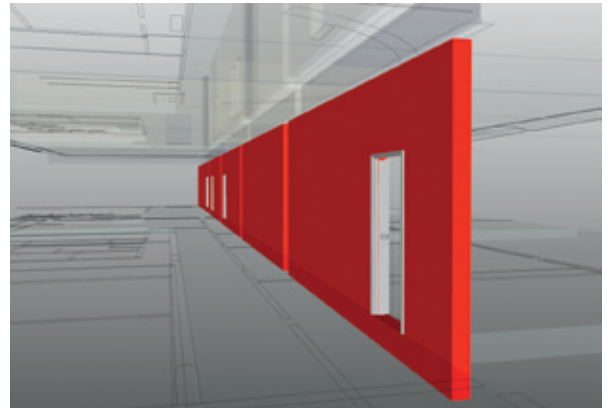
*Each space should have a defined usage identifier and name*



*Highlighted wall components surround a void in the middle of the building - an area with no modelled space*



*Models should meet accessibility codes*



*Selected wall components doesn't touch above*