BIM at Boao Airport: New Vitality and New Vision Postprint

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Date: 2017-11-06T22:41:49+00:00

Abstract

The 2016 Boao Forum for Asia established its theme as "Asia's New Future: New Vitality and New Vision"; similarly, BIM technology has brought "new vitality and new vision" to the construction application of Boao Airport.

Full Text

Preamble

Journal of Information Technology in Civil Engineering and Architecture, Volume 8, Issue 1, February 2016

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At 12:20 on March 17, 2016, Hainan Airlines flight HU7777 from Beijing landed smoothly at Boao Airport, marking the first trial operation flight. Over the subsequent ten days, five airlines—Hainan Airlines, Tianjin Airlines, Capital Airlines, Lucky Air, and West Air—operated direct flights between Boao and seven cities (Beijing, Guangzhou, Shenzhen, Zhuhai, Kunming, Chongqing, and Guiyang) to test and validate the airport's operational capabilities. This ensured the airport could meet the "single-location conference" requirements for the Boao Forum for Asia, successfully supporting the event held from March 22–25, 2016. The 2016 Boao Forum for Asia adopted the theme "Asia's New Future: New Vitality and New Vision," and similarly, BIM technology brought "new vitality and new vision" to the construction of Boao Airport.

As a key supporting project for the 2016 Boao Forum for Asia Annual Conference, Boao Airport was approved by the National Development and Reform Commission for construction. The project site is located in Zhongyuan Town, Qionghai City, 12 kilometers from downtown Qionghai and 15 kilometers from

the permanent Boao Forum venue—the Boao International Conference Center. The airport covers an area of 2,732 mu (approximately 182 hectares) and includes a new 2,600m × 45m runway, two vertical taxiways, one 9,000m^2 terminal building, two aerobridges, Category I instrument landing systems with 900m Category I precision approach lighting systems at both runway ends, and 26 apron stands (4C+22B). Supporting facilities include communications, navigation, meteorology, power supply, water supply, fuel supply, and fire rescue systems, accommodating medium-to-large aircraft such as Boeing 737s and Airbus A320s. The main project investment totaled 1.127 billion RMB, with total investment reaching 1.91 billion RMB including supporting works and land acquisition compensation.

From groundbreaking on March 19, 2015, to completion, the entire construction period lasted only ten months, creating a miracle in global civil aviation construction history and imposing exceptionally high demands on quality control throughout the process. To effectively ensure project progress and quality, the BIM and Information Technology Research Center of the China Academy of Building Research provided full-process BIM technical support for the airport construction. From initial scheme comparison to design deepening during construction, process simulation, quality and cost control, and finally to model information maintenance and handover upon completion, the project embodied the diligent efforts of BIM professionals at the China Academy of Building Research. This was a veritable race against time: with a construction period far shorter than comparable BIM-enabled projects, the BIM work needed to accelerate several-fold while maintaining precision in every detail. Construction models, site models, and interior finishing models all required integration of construction considerations under fully optimized designs to achieve first-time accuracy and strictly control rework. Every on-site change to finishing effects or pedestrian circulation routes was immediately fed back into the master model to ensure high consistency between data and actual conditions. Meanwhile, arrival and departure routes for regular passengers, VIPs, and dignitaries were simulated for both forum and non-forum periods to ensure smooth operations during the conference.

Short construction period, high requirements, and critical mission responsibilities characterized the BIM consulting services for Boao Airport. Through this project's implementation, the BIM and Information Technology Research Center of the China Academy of Building Research elevated its BIM capabilities to a new level in precise design, professional control, collaborative work, and schedule management. The synchronized advancement of virtual construction and actual construction provided powerful assurance for the successful handover of Boao Airport.

(Contributed by the BIM and Information Technology Research Center, China Academy of Building Research)

[Figure 2: see original paper]

[Figure 3: see original paper]

Note: Figure translations are in progress. See original paper for figures.