The System

Our new system (“SEIJU”) has been developed to meet the nature of this building. This system will be applied to Block 1 only according to contract requirement, and the other 3 blocks will be constructed by conventional method. Fig. 12 shows the overall concept of SEIJU.

This system consists of the following fundamental elements:

1) Temporary steel truss roof
2) Self climbing temporary masts
3) Automatic operated tower crane
4) Auto-conveyor control system

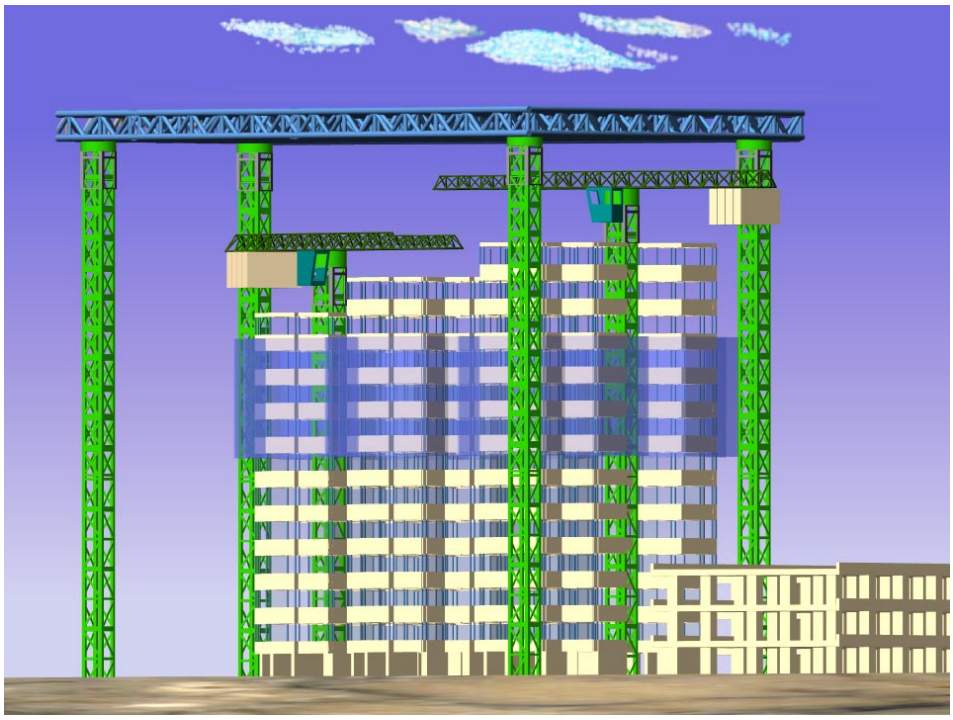

Fig 12. Automated Building Construction System “ SEIJU”

Auto-conveyor control system outline

As described in the outline of this project, huge number of pre-cast elements is used for the superstructure. That may cause some confusion or mistake on site unless a control system is established. In order to solve this problem and to meet the requirements of automated construction, we are going to apply the auto-conveyor system for pre-cast installation.

This system will be adopted from the manufacturing stage, and also the delivery and installation stage, all under computerized control. Procedure of the system is shown as below.

1) In-put the data of all pre-cast elements
2) Establishment of bar-code numbering to each element
3) Manufacturing and delivery to site in an order as required by site
4) Scanning of bar-code marked on pre-cast members before lifting
5) Forwarding the scanned data to the computer of the tower cranes
6) Auto-convey of pre-cast elements up to 1m above the final position
7) Installation of the pre-cast members properly by manual operation at tower crane

Throughout all steps of pre-cast works, all data is on the project-net computers, which are connected with the pre-cast factory and the site office. These data can be used for progress monitoring and review. Fig.13 shows this network system.

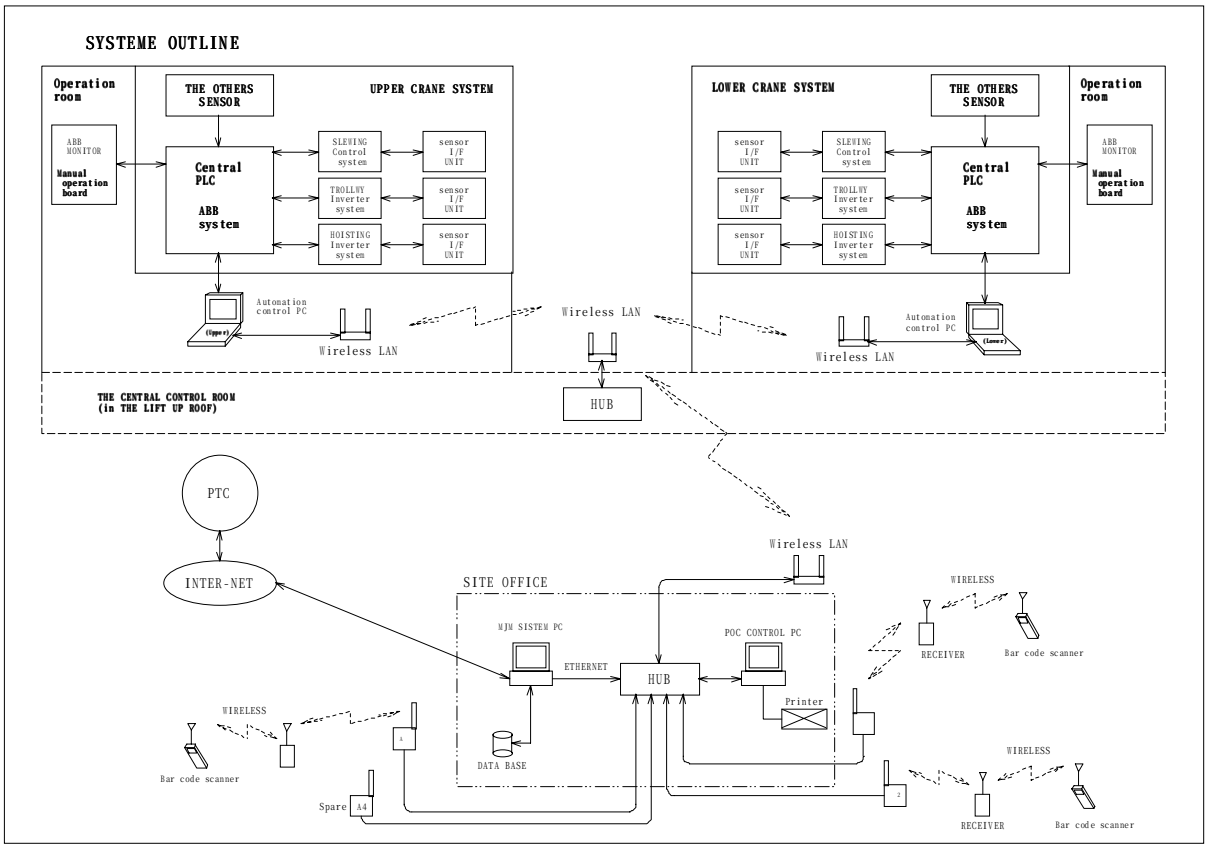

Fig.13 System Outline

According to our primary estimation, using this automated construction system, 3days can be achieved for the construction of one typical floor and a total of 4 month can be reduced from the conventional construction method.

Recommendation

Through the above 2 cases, we reach the following conclusion and suggestion.

* Sheltered and automated construction method is adoptable and beneficial to various types of projects.
* Contractor is to be on board earlier or from design stage for innovation of overall project.
* Maximization of off-site fabrication is the critical way to improve site progress, safety, quality, environment and social benefit.

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