DEVELOPMENT OF INFORMATION SYSTEM FOR LARGE-SCALE STRUCTURAL STEEL FABRICATOR'S PRODUCTION MANAGEMENT

Jung Gon Kim[1]*, Naiyuan Chi[2], Tsuneo Kakuta[3], Satoru Furukawa[4], and Shuzo Furusaka[5]

[1] *Department of Architecture and Architectural Engineering, Kyoto University, Kyoto, Japan*
[2] *MCS STEEL CO. LTD, Executive Chairman, Bangkok, Thailand*
[3] *MCS STEEL CO. LTD, Vice President, Bangkok, Thailand*
[4] *MCS STEEL Japan, System Development, Tokyo, Japan*
[5] *Department of Architecture and Architectural Engineering, Kyoto University, Kyoto, Japan*
** Corresponding author (j.kim@fx5.ecs.kyoto-u.ac.jp)*

ABSTRACT: This paper deals with the development of information system for steel fabricator to manage its production and delivery works. Each fabricator has different production and quality management capabilities. However, most of the proposed information models for steel construction management have focused upon the construction site for delivery and erection of structural steel members. Moreover, each fabricator's individual properties have never been appropriately considered in the development of information system. In Japan, steel fabricators developed their specialization depending upon new projects contracted through their general contractors and their fabrication capabilities. Therefore, the development of information systems to support steel fabricator's work should take in to consideration, the type of fabricator involved and their work process. In addition, interoperability with stakeholders, such as the client, the designer, and the general contractor should also be taken in to account. Introducing the surveyed results of large-sized fabricator's works and their information systems based upon barcodes, to support steel fabricator's production work, such as material tracking, inventory management, and performance measuring, we discuss fabricator's information systems and developmental assignment to extend the applications throughout the fabricator's overall work stages for steel member production.

***Keywords**: Structural Steel Members, Fabricator, Barcodes, Information System, Production, Quality Management, Design Change*

1. INTRODUCTION

These days, many high-rise buildings in Japan are constructed using structural steel members. Therefore, it has become an important assignment for general contractors (GC) to compose stable delivery systems for structural steel members [1]. This paper deals with the production and delivery of fabricated structural steel members. The steel fabrication industry in Japan has been specialized and professionalized for a long time. As a result, each fabricator has different roles according to their size and production capabilities. This disparity was mentioned and defined as several groups considered production styles and works for fabricators, and explained the classification system of steel fabricator in Japan [2].

Commonly, Japanese GCs used to contract with steel fabricators directly so that they control the production and delivery with quality assurance. However, most GC information systems for steel construction focus on special issues such as material delivery, performance estimation and so forth.

This paper introduces a fabricator's information system based on barcodes. And then we discuss fabricator's developmental assignment for information systems to extend the applications throughout the fabricator's overall work stages for steel members production.

2. STRUCTURAL STEEL FABRICATION PROCESS AND IMPROBABILITY ASSIGNMENT

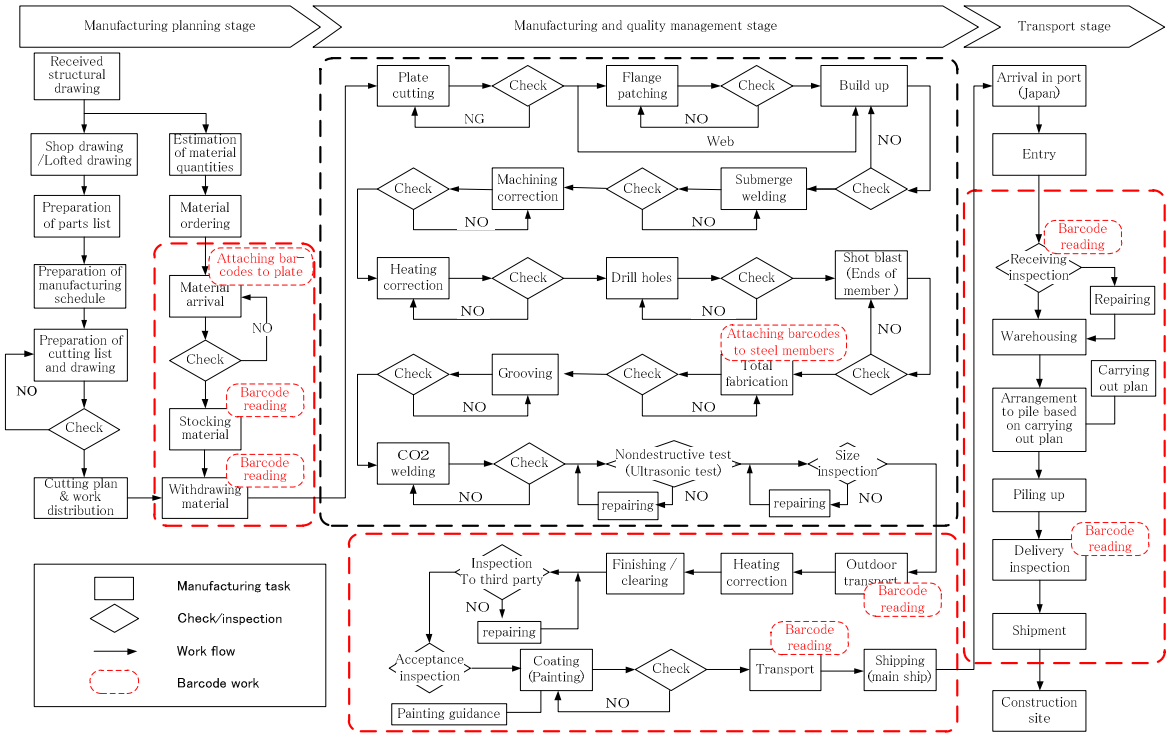

Fig.1 Fabricated structural steel production process for beam members

A large-scale structural steel fabricator has developed an information system depending upon barcodes. That production system is composed of several small systems, those were separated functionally, to control plate and fabricated member during production and delivery. Most of functions for the information systems have developed by degrees over ten years. As a result, those systems are stable to control the production and delivery. However, when design changes occur, there are some problems in measuring and monitoring performance and progress of production lines in the inner factory. This is a major reason problem in decision making for production control. Sometimes production lines are liable to stop, and so overall information should be reviewed totally.

Therefore, firstly we studied the fabricator's production and information systems, and then detailed reasons for design change to investigate an appropriate method.

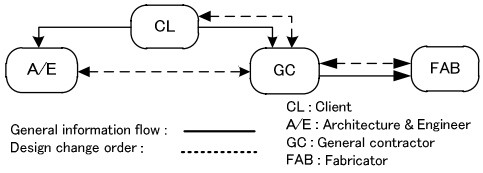

Fig. 2 General information flow and design change order

Fig.1 shows a detailed production process for large-beams as a case study. We focused on the information flow of design change and different ways to pass change orders. Almost all design change orders are passed to the fabricators.

3. CONCLUSION

In this paper we introduced fabricated structural steel production process, and an information system based on barcodes. We then discussed issues to develop information systems for fabricators. The biggest problem is to respond to design change orders appropriately throughout the fabricator's information system. Next we will study a responding method of design change, but it is necessary to include practical data from fabricators.

REFERENCES

[1] Kim, J., et al, "Study on production system of steel member in building construction project", JIA annual meeting, Vol.F-1, No. 8091, pp. 1283-1284, 2010.

[2] Umekuni, A., et al, "A Study on boundary of production processes for steel members", JIA annual meeting, Vol.F-1, No. 8093, pp. 1287-1288, 2010.