MEASURES FOR THE DEVELOPMENT OF CONSTRUCTION MATERIAL QUALITY MANAGEMENT INTEGRATION SYSTEM

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Abstract - Steel and other construction materials are required to earn KS certification or pass quality testing to earn KS certification-level or higher performance levels. However, a proper construction material quality management system has yet to be secured in order to prevent malpractices such as the falsification of quality test reports. This study worked out system construction measures designed to verify and monitor the entire process of construction material quality management from test requests to issuance of test reports, as well as to manage the information on test requests, information on specimens, basic information on construction works, sealed information, search/statistics, tracing, history management, statistical management, quality test, etc.

Index Terms - Intergration, Construction Material, Quality Management

INTRODUCTION

In recent years, malpractices are being committed in which low-quality road decking panels and other faulty construction materials by falsifying test reports are supplied and used in the construction fields. This continues to pose safety problems and worries.

Such bad cases are outlined as follows: non-KS-certified Chinese-made steel (H-beam) without being tested for its quality was used in the construction field (Office for Government Policy Coordination, news release, May 2016); surprise investigations by the Ministry of Land, Infrastructure and Transportation (MOLIT) revealed that, of 802 field sites, 130 used construction safety-defective materials and that over 50% of the major construction material special plywood proved to be defective in terms of performance (Money Today, September 2016); and Chinese-made low-quality road decking panels were supplied to the construction fields by falsifying test reports (Briefing by National Police Agency, May 2015).

Construction materials and supplementary materials are required to conform to quality standards according to Article 57 of「The Act on Construction Technology Promotion」. According to Article 18 of the same Act, non-conformance data in relation to construction works, etc. are required to be put into the construction technology information system. However, requests for the quality inspection of construction materials are currently being made as applicants visit the relevant agency to apply in writing, making it difficult to assess the suitability of sampling, and quality inspection procedure for inspection requests, etc. Thus, the current construction technology information system offers only the function of registering quality test reports, thus failing to meet the requirements stipulated in the laws.

To resolve these problems, this study came up with measures to develop the information system which can boost the transparency of inspecting the quality of construction materials in the entire construction material quality inspection process from requests for quality inspection to issuance of test reports.

II. SUBJECT

A. Relationship between Construction Works and Inspection of Construction Material Quality

The construction material quality inspection is conducted under the close relationship among MOLIT (assessor), clients, quality inspection agency, construction fields (supervisors, constructors), and producers thereof. Quality inspection requests need to be managed from the time of placing orders for construction works, and they are currently being managed finally after registering test reports in the construction technology information

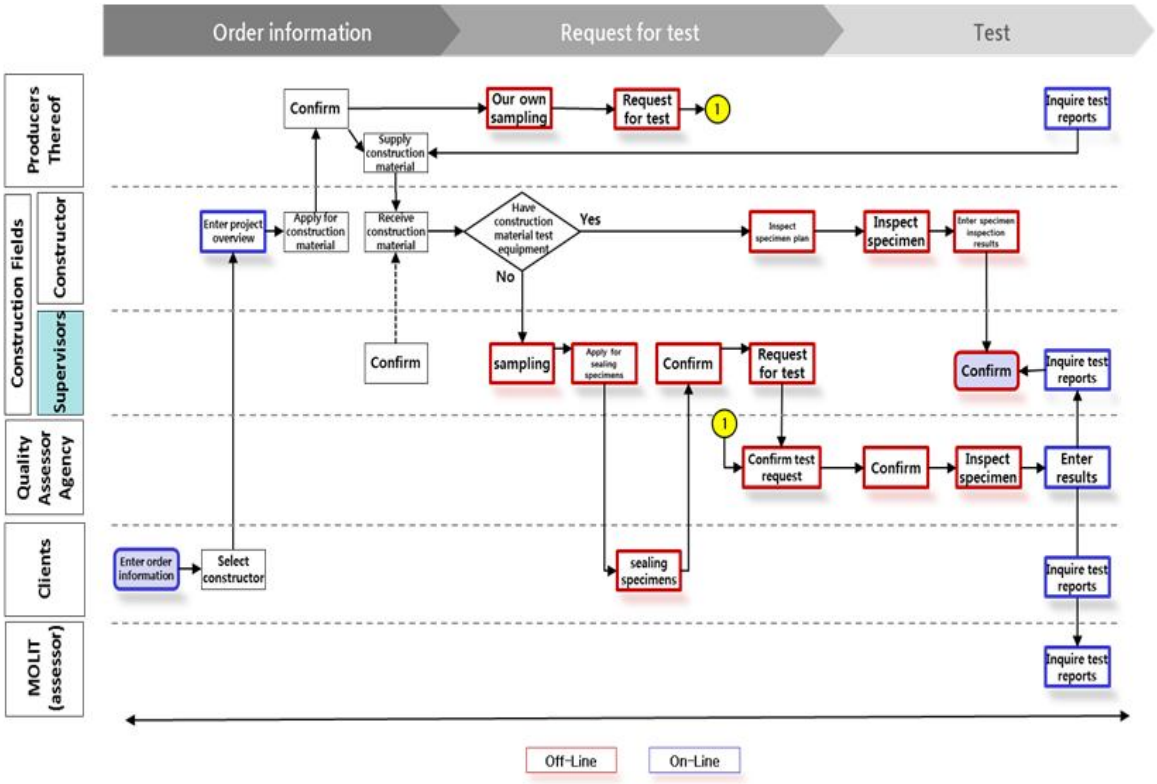


Figure 1. Flow of quality test requests and issuance of test reports

The quality assessor agency shall receive test requests from applicants (construction fields) according to the Act on the Promotion of Construction Technology, shall conduct test, and shall send the results to applicants. Test reports are mostly sent by mail, and in the process of being delivered, they may be lost or damaged or they may be falsified and forged after being delivered.

With regard of defective construction executions, constructors and quality inspection institutions may transfer their accountability to each other, making it difficult to identify the cause of defective works and to define the accountability. To resolve these problems, test reports and data created in the process need to be managed by certified institutions.

B. Registration and Management of Quality Inspection Institutions

Quality inspection institutions shall register with Korea Association of Construction Engineering and Management (KACEM) according to the Act on the Promotion of Construction Technology. KACEM shall review the applications, issue certification certificates where approved, and manage the registration books.
According to the Enforcement Ordinance of the Act on the Promotion of Construction Technology, MOLIT (assessor) shall receive the previous year's quality test and inspection service results each year by January 31 to manage the quality test service results, etc.
The assessor agency requires the quality inspection institutions to enter test and inspection reports issued following the test and inspection in the information system, and to check the quality test and inspection and inspection service results based on the entered information by using the predetermined format-based screen and output function.

In addition, quality inspection institutions, which have developed and are managing a separate statistical screen on test entry overview by quality inspection specialist institution, are required to easily check the number of quality test and inspection reports entered.

III. MEASURES FOR THE DEVELOPMENT OF CONSTRUCTION MATERIAL QUALITY MANAGEMENT INTEGRATION SYSTEM

The construction material quality management information should be developed so that MOLIT (assessor), clients, quality inspection agency, construction fields (supervisors, constructors), and producers can use it.

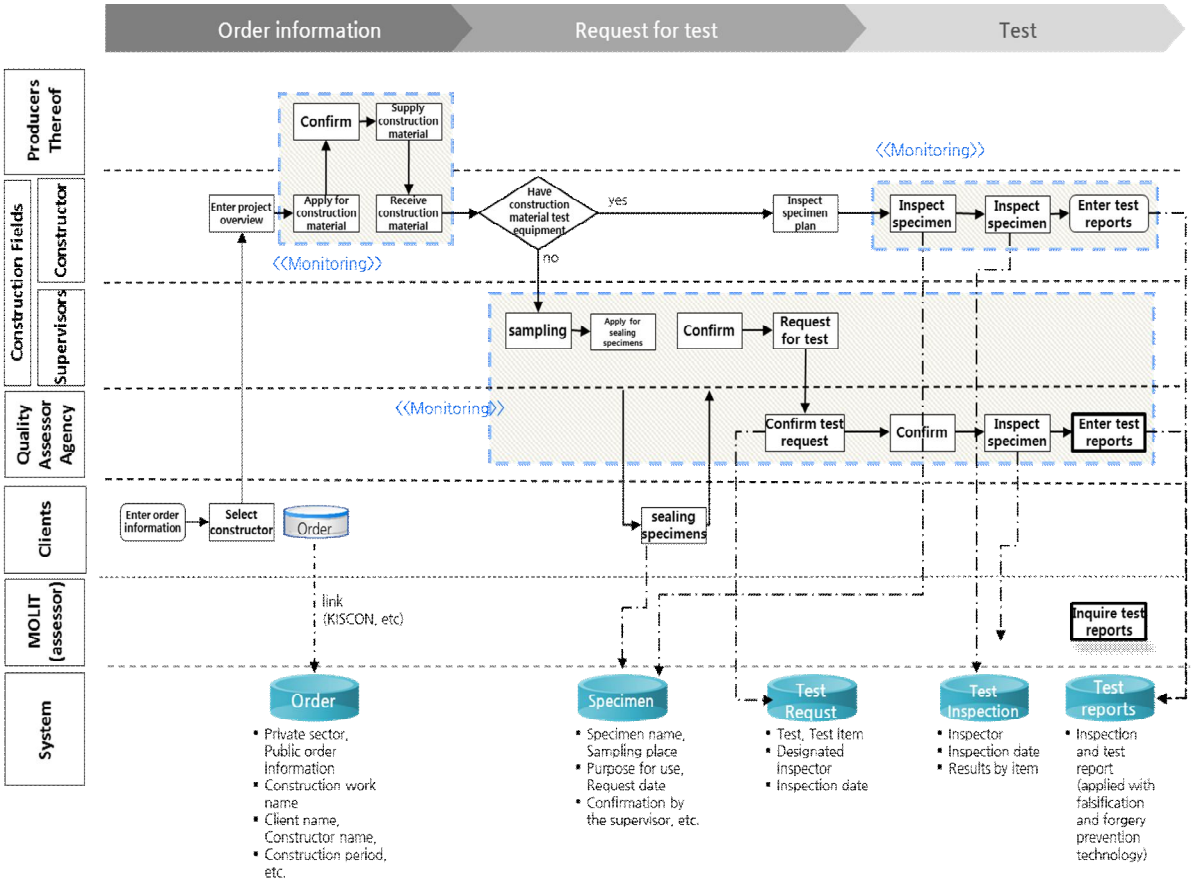


Figure 2. Integrated management process for construction material quality (plan)

The above diagram describes the system for addressing the problems discussed in the Introduction, showing the flow of work wherein from which the information can be obtained along with the work flow. First, the basic portal and system should be constructed to ensure the online management of construction material quality, and target works were designed so as to use the information by linking the system to other systems.

1. First, work should be redesigned to use the existing entered order information by linking with the KISCON system without entering the information again
2. Second, work should be redesigned to block the producers' abnormal act of directly receiving test reports for construction materials by systemizing the stages of applying for construction materials, checking material, and receiving material
3. Third, work should be redesigned to monitor the stages of sampling, sealing of specimens, and inspection of specimen when directly testing construction material
4. Fourth, work should be redesigned so that all works can be conducted through the system, and that the relevant information can be stored in the database of construction material quality management system so as to inquire of the information anytime as deemed necessary according to stages of work

To construct this construction material quality management integration system, the system need to be linked to the following external information systems.

1. Construction administration system (Seumteo): To gather private-sector construction works' name, commencement date, projected completion date, and basic project information
2. Construction industry knowledge information system (KISCON): To gather public construction works' name, commencement date, projected completion date, and basic project information
3. Construction project informatization system (CALS): To gather the current construction works' approvals, contract details, and other construction status information
4. Public Procurement Service: To gather the information on KS certification changes with regard to the supplied construction materials
5. Quality inspection institutions: To gather documents created in the process of stages related quality test reports according to the quality test procedure

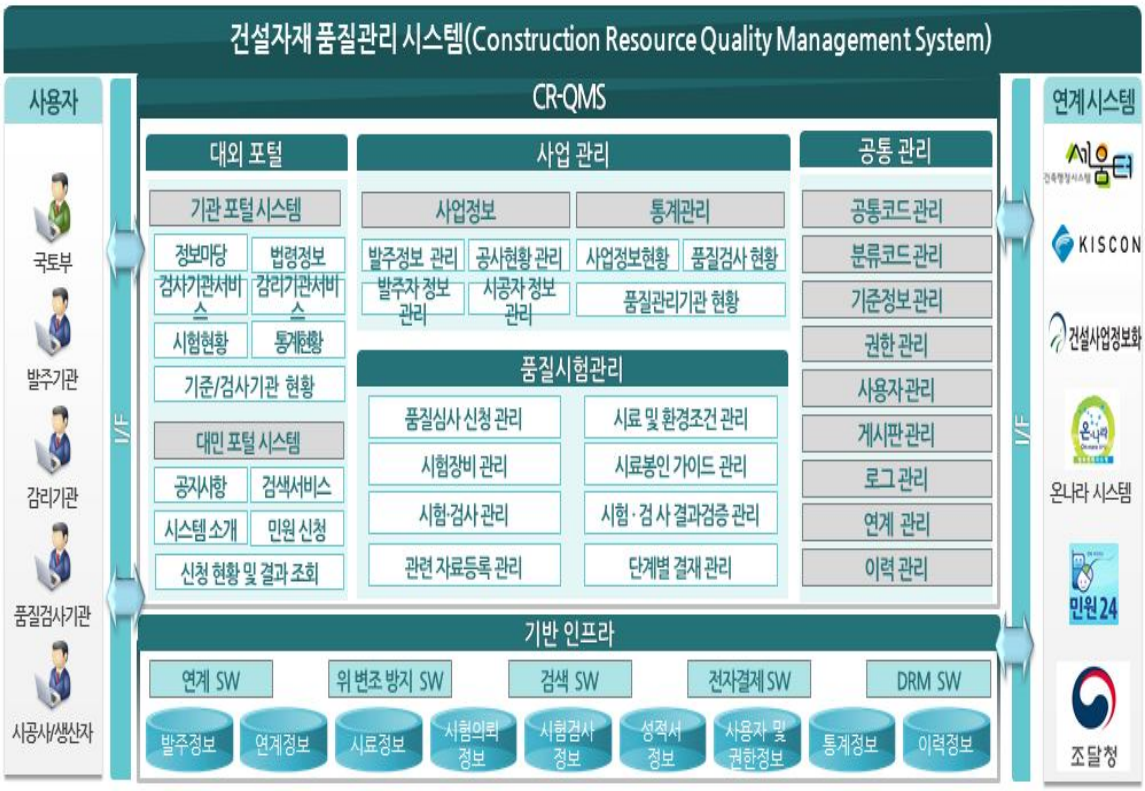


Figure 3. Diagram of the target model of integrated management of construction material quality

The construction material quality management integration system needs to be developed so that the following services, including external portals, quality inspection, and quality specification management, can be provided.

1)

1. External portal for construction material quality management: Agency portal system services that provide the overall law information concerning the construction material quality management and the functions of search, manuals, etc., plus the private-sector portal system services that offer notices and have the functions of searching and outputting application results
2. Construction material quality inspection: Construction material standardization services that, for application/ test monitoring management, and for the inspection of construction material quality, enable the handling of specimen inspection applications, the management of specimen test and inspection, and overall work monitoring
3. Construction material quality project management: Project management services that enable institutions and users related to the construction material quality management work to search/output the current project status and progress, etc.
4. Common management of construction material quality: Services that enable the management of the rights of managers for the management of construction material quality system, the management of linking, and the management of users, among other common management item.

CONCLUSION

The establishment of measures for constructing the information system designed to manage the quality test results with regard to 130,000 cases of construction projects a year offers expectations that illegal and insolvent construction material can be fundamentally blocked son as to boost the reliability of material, to monitor the entire process of construction material quality management work to strengthen the transparency of work and to handle the construction material quality management work anytime anywhere, thus boosting work efficiency.

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