

CLEAN CONSTRUCTION SYSTEM

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1. Background of CCS

1-1. Construction Corruption and Faulty

- Although many actions have been taken to improve transparency of construction projects in Korea since the mid-90s, transparency level of our construction industry scored 54.21 points out of 100 points and remained to be the serious problem. Twenty-five to fifty four percent of the social decay in Korea occurred in the construction sector according to the data from the Supreme Prosecutors' Office and the Citizens' Coalition for Economic Justice.
- Construction-related corruption accounted for 40.4% in 2005 and 25.2% in 2006. According to the analysis of The Citizens' Coalition for Economic Justice, 412 cases accounting to 53.9% of a total 765 corruption cases reported in the media between March 1993 and July 2006 were related to construction.
- Corruption in the construction sector leads to safety accidents due to poor construction and neglect of safety management forms, and the side effects of such actions resulted in disasters such as 'Collapse of Seongsu Bridge' in 1994 and 'Collapse of Sampoong Department Store' in 1995.

Collapse of Seongsu Bridge (1994)



Collapse of
Sampoong Department Store
(1995)



1-2. Delayed Payment of Wage and Inefficient Construction Management at Construction Site

- In the construction industry, a significantly high rate of delayed payment of wage has been reported compared to other industries. A survey conducted by the Ministry of Employment and Labor in 2011 shows that the number of construction workers who have reported delayed payment of wage is about 18,000 and the amount is about 86,000,000,000 KRW. These values are almost twice of those in other industries. The reality is, however, worse than the reported figures. Around 68.8% of actual construction workers have experienced delayed payment of wage. This can be attributed to the complex construction industry structure where clients, contractors, subcontractors and workers are part of the same wage chain. The delay payment of wages is the most likely to happen to subcontractors.
- Under the present system, when a subcontractor bills a contractor for subcontract prices, the contractor charges a public institution for construction prices. The public institution confirms that the contract has been properly implemented and then, makes the payment to the contractor. The contractor must pay the subcontractor for the subcontract price within 15 days of the receipt of the construction price. Thus, the payment process may be distorted, for instance, after the contractor diverts first the subcontract price received from the client for other purposes if he or she pays the subcontract price when the 15-day deadline expired. In addition, when the contractor becomes bankrupt and does not pay the subcontract price, the present system does not help the subcontractor, resulting in many social issues.
- To prevent the contractor from not paying the subcontract price, the public institution can put in place a system for separating subcontract prices from construction prices and paying the subcontract price directly to the subcontractor. This would result in the contractor losing coordination with the subcontractor's business, thereby degrading quality of construction and creating bad blood between the contractor and the subcontractor.
- At that time, all administrative procedures of public construction were done by handwriting. The contractor must visit a public office (a client) directly, and submit paper report of daily, weekly, and monthly construction results to the public office. The report includes the work type, construction rate and the amounts of materials and equipment used of an ongoing construction project. Since such procedures were made manually, construction sites have not been managed accurately and systematically. Accordingly, faulty construction is likely to occur.

1-3. Information Disclosure and Anti-Corruption “CCS”

- Korea was the world's 13th and Asia's first to establish the Freedom of Information Act in 1996. This was to prevent wasting government budget and to achieve administration transparency through an information disclosure scheme.
- Korean civil society actively campaigned to request for information disclosure since 1998 to disclose information regarding large-scale national projects in particular such as construction or civil engineering projects. In the early days of the Freedom of Information Act enforcement, the decision for non-disclosure was dominant within the government. However, the disclosure frequency increased due to administrative litigations. The information disclosure scheme itself can improve when citizens and the government both reach an agreement.
- Request for information disclosure through the Internet showed growth from 2002, and the information disclosure scheme rapidly advanced as the information disclosure system was developed. The information disclosure system is unprecedented in unifying the request for information disclosure from central government agencies, local governments, education offices and other public agencies.
- In order to guarantee citizens' right to information and to achieve administrative transparency and accountability, the Seoul Metropolitan Government (SMG) carried out “Nude Project” that discloses all the administrative information except for private information that is protected by the law.
- The SMG has built Seoul Information Communication Plaza to automatically disclose the administrative information and to enable citizens to easily access and utilize by using smart phones. The Seoul Information Communication Plaza is the world's first system to easily search various types of information regarding construction and civil engineering.
- The “CCS” was designed to accommodate social needs which deemed necessary. This system enabled local civil servants and all relevant parties of the construction project to share information smoothly and manage construction efficiently and systematically. They could resolve issues such as chronic delay of payment or nonpayment of construction cost to subcontractors. In addition, citizens can find information about payment status as well as the extent of construction progress that is carried out around their home. Therefore, the CCS is continuing to evolve into a system with “openness, innovation and transparency”.

2. Overview of CCS (CCS : Clean Construction System)

2-1. Organization of CCS

- The CCS consists of three parts: “One-PMIS” to manage process of construction project, “E-direct Payment System (e-Baro)” to separately pay the contract and subcontract cost and; “Construction Information Disclosure System (Construction Allimi)”, which is a website for opening up information on construction status to citizens.
- In recent years, the SMG has made efforts to carry out “Electronic HR Management Scheme” that connects Seoul's One-PMIS with “Electronic HR Management System”, which is from the Construction Workers Mutual Aid Association under the Ministry of Employment and Labor. This is expected to prevent the omission of construction workers' retirement allowance from the employment history. Moreover, by identifying the accurate number of workers, steps can be taken immediately when an accident occurs on the construction site.



2-2. Purpose of CCS

- The purposes of CCS are to ensure that the construction projects are transparent. This can be done by the following: systematic and efficient process management of construction and information sharing between all relevant parties via “One-PMIS”, separately paying the construction cost via “e-Baro”, identify the accurate number of construction workers to prevent the omission of construction workers’ retirement allowance from employment history via “Electronic HR Management Scheme” and; ensure citizens’ right to information and to improve integrity in the construction sector by the real-time disclosure of construction information called “Construction Allimi”.

◆ One-PMIS is an integrated construction information management system that combined CPMIS (Seoul Construction Safety Management Headquarter Facilities Bureau), PMIS (Urban Railway Bureau), and TPMIS (Investing Institution and Borough) which were construction information related systems before 2011.

※ Combine CPMIS (Seoul Construction Safety Management Headquarter Facilities Bureau), PMIS (Urban Railway Bureau), and TPMIS (Investing Institution and Borough) which were construction information-related systems before 2011, into an integrated construction information management system (One-PMIS)

2-3. Principal Content of CCS

○ One-PMIS

| | |
|----------------------|---|
| Purpose of Operation | To achieve transparent and efficient business management as well as safe construction management of projects ordered by the SMG (including affiliated institutions and 25 boroughs) through accurate and systematic management process and information sharing between the construction personnel |
| Target Business | Construction projects over a contract price of 20 million KRW Content of Operation: Process, safety, history, data management related to the SMG’s construction projects |
| Content of Operation | Process, safety, history, data management related to the SMG’s construction projects |
| User | Construction personnel such as a construction supervisor, constructor, supervisor and etc. |
| System Construction | April 2011–February 2012 |



Construction Allimi (Construction Information Disclosure System)

| | |
|-----------------------------|---|
| Purpose of Operation | Implementation of a transparent construction administration through disclosure of construction information to citizens by the SMG |
| Target to be opened | On-going construction projects ordered by the SMG, and construction projects less than 3 months after completion |
| User | Citizens (no membership required) |
| Open Data | 15 types of information such as construction overview, contract execution status and etc. |

- ① Project overview (Construction period, Project cost, Site location, Project scale, Ordering party, Constructor, and Construction project management office)
- ② Construction rate ③ Construction status ④ Execution status
- ⑤ Electronic payment document ⑥ Construction work photo
- ⑦ Participant status ⑧ Weekly work report (the contents of work)
- ⑨ Data on a presentation for residents ⑩ Exemplary safety inspection case
- ⑪ Penalty point management ⑫ Design change ⑬ Extension of construction period
- ⑭ Introduction to a specific product (Construction method)

※ Application for citizens to tour the construction site and guidance of reception desk to report overdue wages

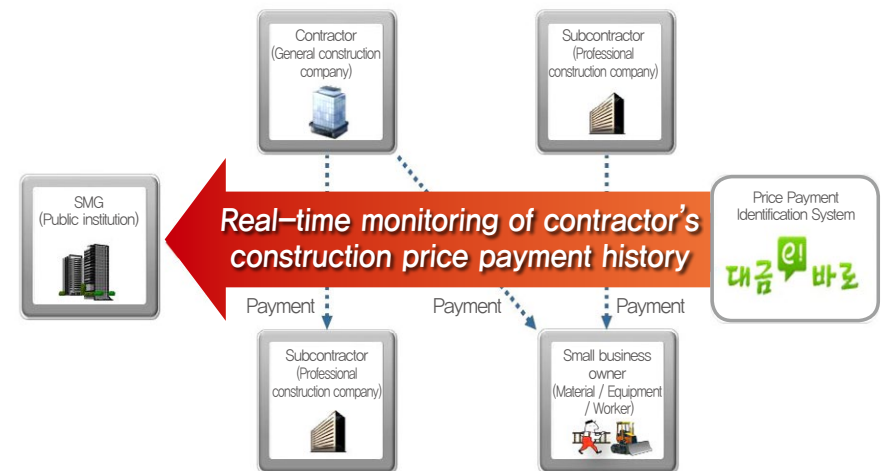
Disclosure of Construction Information (Construction Allimi)

Management of Construction Information (One-PMIS)



e-Baro (E-direct Payment System)

| | |
|-----------------------------|---|
| Purpose of Operation | Contractors delaying the payment of wages to subcontractors can be settled by allowing ordering body to pay the cost to companies individually in cooperation with financial institutions |
| Target Business | Construction projects over a contract price of 20 million KRW and having a construction period of more than 3 years |
| Content of Operation | Management of individual accounts of constructors, equipment and material suppliers and workers. Management of the history of the construction payment |
| User | Construction supervisors and constructors |
| System Construction | March 2011–October 2011 |



3. Function and Procedure of CCS

3-1. One Project Management Information System (One-PMIS)

○ One-PMIS ?

A construction project consists of four steps: planning, design, construction, and maintenance. **One-PMIS** is a system that manages the construction steps – more specifically, **the processes from the commencement of the construction project to its completion.**

○ The primary functions of One-PMIS

First, construction is managed systematically and efficiently by computerizing the process management and process reports.

Second, construction materials in use, construction workers and the use status of construction equipment can be identified in real-time.

Third, the production of unnecessary paper documents can be minimized by utilizing electronic files.

Fourth, system-based data management enhances transparency of reporting line and also management of construction histories among clients, supervisors and constructors.

Fifth, computerization allowed all the information to be analyzed and stored as valuable statistical data.

Sixth, the key information of One-PMIS is made accessible to citizens through Construction Allini.

○ Procedure of construction information management

- When the construction contract is made, the constructor must submit the commencement report to the client, as the contract document states. The commencement report must include the following:

- On-site engineer designation report
- Construction process schedule
- Safety, environment and quality management plan
- HR and equipment allocation plan in every process
- On-site photo before the commencement of construction
- Other matters specified by a person in charge of the contract

- The constructor completes user registration and process plan registration through One-PMIS within 7 days after the submission of the commencement report and starts business management and process reporting through One-PMIS. (SMG's special conditions of construction contract, SMG's One-PMIS operation guideline)
- When an unexpected event and an increase or decrease in the construction quantity or changes in the plan occur during the construction work, the original design must be changed. The design is not originally amendable. If the change in design seems to harm the purpose or nature of the contract, a new plan must be established and re-ordered.
- The constructor can request a part of the total cost to the client. The cost is proportional to the earned progress of the entire project during an ongoing process after the commencement of construction. The client, along with the supervisor, performs field inspection and gives approval after checking whether the requested part was constructed to conform to specifications, design drawings, and quality standards before he pays the cost. The client confirms when the construction project is said to be completed, whether the on-site structure is consistent with final design drawing and the contract is implemented. Once the client confirms whether the final structure is successfully constructed, he treats it as completed. During the completion inspection, the client pays all the remaining balance except for the payment already made in proportion to the progress of the contract.

Procedure and Business by Construction Work Step

| Construction step | Business by step |
|--|--|
| Land compensation | <ul style="list-style-type: none">Private land included by force and purchase contractPublic land purchase or free-to-use negotiation |
| Contract Review | <ul style="list-style-type: none">Appropriateness examination for cost estimation (estimated price) according to the working design |
| Construction ordering | <ul style="list-style-type: none">Ordering construction work based on estimated price, according to the results of the contract reviewEstimated price includes net construction cost (material costs, lab or costs, expenses), profit, and value added tax (VAT). |
| Construction contract | <ul style="list-style-type: none">Announcement, price bid, and successful bid through a specified information processing device (Public Procurement Service G2b)After examining the performance of construction work from a first successful bidder, contract him or her after he or she passes the examination |
| Commencement of construction project | <ul style="list-style-type: none">Submit report for starting the construction work according to contract documents (including a construction process schedule and plans for safety, environment, and quality management) |
| Design change | <ul style="list-style-type: none">Change the original design due to increase or decrease in construction quantity, changes in the plan, etc.Adjust the contract amount, change the construction period, etc. |
| Construction management | <ul style="list-style-type: none">Manage construction quality, construction, process, safety and environment |
| Tracking of the progress of payments and completion inspection | <ul style="list-style-type: none">Inspection of the extent of progress of contract quantity and payment of the concerned prices (progress payment)Inspection of completion of a contract object and payment of prices (completion) |
| Construction evaluation | <ul style="list-style-type: none">Evaluate from 90% progress of construction work to the end of February in the next year of completionQuality, process, construction, safety, environment, construction rate, reduction of construction prices, and property damage |

Procedure and Business by Construction Work Step

| Step | Detailed procedure | Participant | Related law |
|-------------|------------------------------------|---|---|
| Planning | Business idea | <ul style="list-style-type: none">Ordering institution (Government and local government) | <ul style="list-style-type: none">Construction Technology Promotion ActNational Finance ActLocal Finance ActPrivate Investment Act |
| | Feasibility study and analysis | <ul style="list-style-type: none">Ministry of Strategy and FinanceKorea Development Institute | |
| | Basic plan | <ul style="list-style-type: none">Ordering institution | |
| Design | Procurement, Contract | <ul style="list-style-type: none">Ordering institution, Public Procurement Service | <ul style="list-style-type: none">State Contract ActLocal Government Contact ActConstruction Technology Promotion ActBuilding ActEnvironmental ActFire Services Act |
| | Basic design (Supervision) | <ul style="list-style-type: none">Construction technology service company (Design, supervision)Architectural design office | |
| | Working design (Supervision) | <ul style="list-style-type: none">Construction technology service company (Design, supervision)Architectural design office | |
| Project | Construction contract | <ul style="list-style-type: none">Ordering institution, Public Procurement Service | <ul style="list-style-type: none">State Contract ActLocal Government Contact ActConstruction Technology Promotion ActFramework Act on the Construction IndustryOccupational Safety and Health Act |
| | Supervision | <ul style="list-style-type: none">Construction technology service company | |
| | Construction | <ul style="list-style-type: none">Construction company (General and specialized) | |
| | Evaluation (Test, test operation) | <ul style="list-style-type: none">Ordering institutionRelated companies | |
| Maintenance | Post-management (Safety diagnosis) | <ul style="list-style-type: none">Korea Infrastructure Safety and Technology CorporationSafety diagnosis company | <ul style="list-style-type: none">Framework Act on the Construction IndustrySpecial Act on the Safety Control of Public Structures |
| | Maintenance | <ul style="list-style-type: none">Maintenance company | |

3-2. Electronic Human Resource (HR) Management Scheme

○ The Electronic HR Management Scheme?

「**Electronic HR Management Scheme**」 is a system that identifies the number of work force accurately by issuing an “electronic card” instead of the manually managed attendance status of workers at the construction site and allowing a worker to record his arrival and departure on a terminal.

○ Function of Electronic HR management scheme

First, it can identify the accurate number of workers present at the site when a construction accident occurs.

Second, it can computerize the manually managed allocation status of construction workers, thereby improving efficiency of administration.

Third, it can secure retirement pay and simplify report work by computerizing the employment histories of construction workers.

Fourth, it can compare the employment history with the labor cost payment history of e-Baro Payment to prevent various types of corruption such as delayed payment of wage.

○ Background of Introduction

- When the accidental collapse occurred at the new construction site of the Sadang Gymnasium, Dongjak-gu, on February 7, 2015, the number of casualties could not be identified accurately, thereby causing confusion in controlling the scene of the accident.
- A burial accident can be handled in a timely manner by identifying the number of casualties accurately and then deciding whether or not to use equipment to rescue them. When there are workers buried under the rubble and the number of casualties is not identified accurately, equipment cannot be used carelessly for safety reasons.
- Therefore, the occurrence of this accident raised the necessity of systematic HR management such as accurate identification of the number of workers at the construction site.

○ Expected Effects of the Implementation of Electronic HR Management Scheme

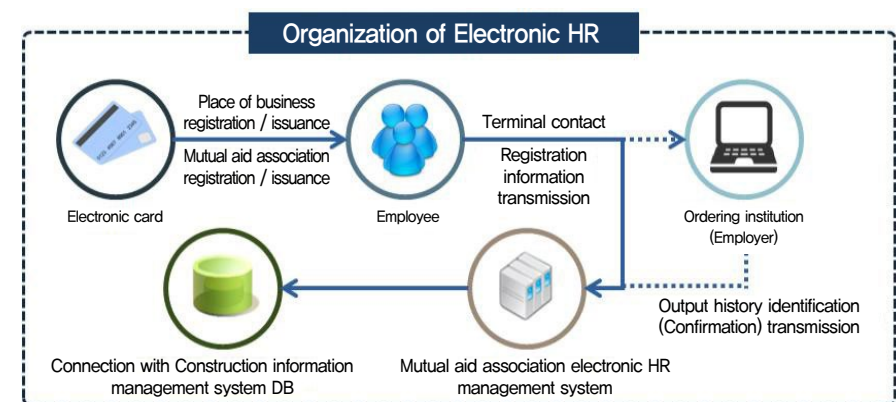
- The introduction of “Electronic HR Management Scheme” can allow accurate identification of the number of workers on the construction site and the

transparency of wages paid to the construction workers to be accurately estimated.

- In addition, the retirement pay of construction workers can be saved automatically, and accordingly, the scheme brings in stability to the lives of the workers and efficient work processing and ensures quicker response to safety accidents.

○ Procedure of Electronic HR Management Scheme

- ① Each construction worker is issued an electronic card, and he or she uses it to record his or her attendance and absence at a terminal.
 - ② Information about the worker is transmitted to the “Electronic HR Management System” of the Construction Workers Mutual Aid Association and to a constructor (an employer).
- ※ The constructor identifies the worker information by correlating with the payment of retirement allowance of the construction worker and then transmits the identified information to “Electronic HR Management System.”
- ③ The SMG displays the worker’s information on “One-PMIS” by interacting with the Construction Workers Mutual Aid Association’s system.



3-3. E-Baro (e-Direct Payment) System

○ E-Baro System ?

- E-Baro system is a payment confirmation system that the Seoul Metropolitan Government made in conjunction with banks to monitor payment status in real-time and guarantee payment of construction price, equipment price, and wages in order to establish a fair-trade culture and protect the social minority.
- When the construction payment is made at the construction site, general construction companies, professional construction companies, equipment materials companies and workers are paid separately through their private accounts.

○ Introduction background

- In the case of construction projects conducted by a public institution, construction work is carried out by contracting general construction companies, rather than by hiring construction workers directly and purchase construction equipment and materials directly.
- The general construction company does not perform large-scale construction work directly. They contract (subcontracts) the work to multiple professional construction companies to carry out the project.
- Accordingly, the payment structure of construction costs consists of several stages like an ordering institution (a public institution), a general construction company (a contractor), a professional construction company (a subcontractor), an equipment and material company and a construction worker.

○ Delayed Payment of Construction costs

Various problems have occurred because the payment structure of construction costs is vertical and multilayered. The biggest problem is that construction costs paid by the ordering institution are not delivered to construction workers and equipment and material suppliers, which are at the end of the chain, due to delayed payment or bankrupted subcontractors.

Protection of
the construction
workers



Complex subcontract structure on the construction site

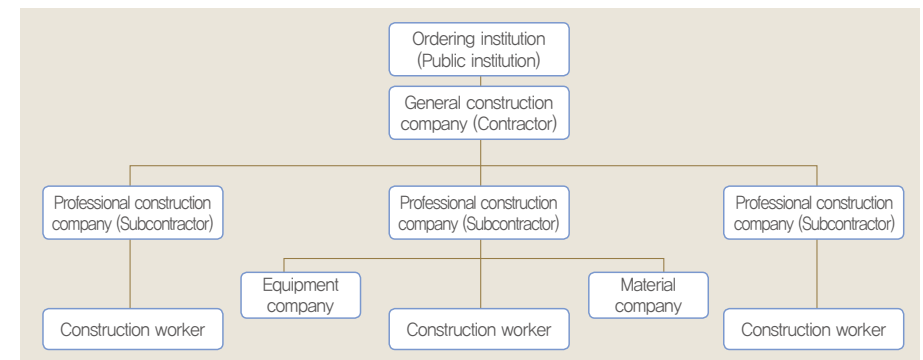
Increases in civil complaints of workers
who are the social minority, citing delayed payment

Systematic and fundamental too for preventing delay
in payment is needed

○ The necessity of Improved Construction Costs Payment Structure

Those suffering from the structural absurdity of payment in the construction industry are the hardworking construction workers and the suppliers. Now the need for a policy protecting the weak in society by improving the construction costs payment structure is emphasizing.

■ Construction Industry Structure



○ Payment guarantee of the construction cost through e-Baro



3-4. Construction Allimi

○ The primary functions of “Construction Allimi” are as follows.

The primary functions of “Construction Allimi” are as follows.

First, it can search for a construction site map and a construction project on the basis of locations from a Geographic Information System (GIS).

Second, it opens relevant information such as photos of construction sites, extension of construction period, design changes, project approval documents to the public.

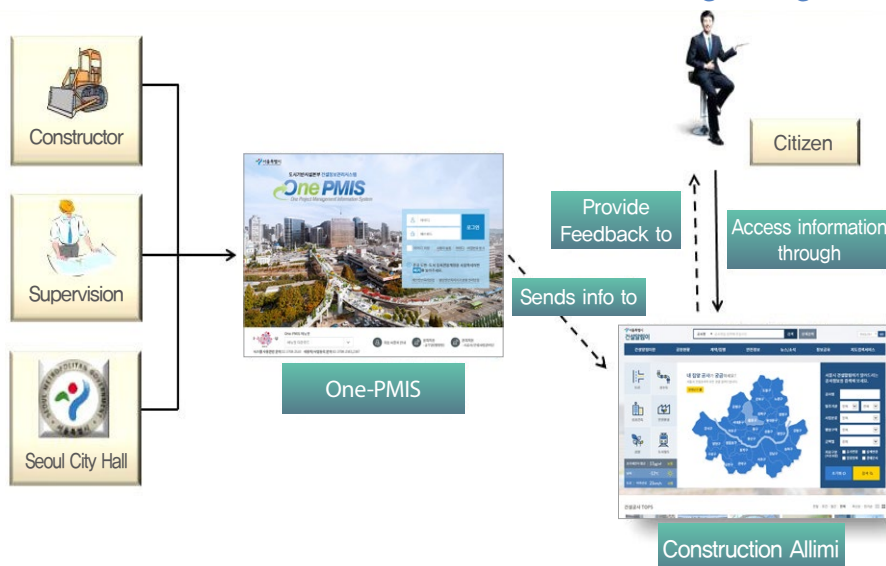
Third, it provides construction-related publications electronically.

Fourth, it shows the contract and execution status for each construction project. Fifth, it shares safety information such as best practices for safety checks, safety manuals, etc.

Sixth, it provides new information related to the construction sector and construction-related statutory information.

- Construction Allimi is an online service by SMG that solves questions about any construction site and provides various information such as project overview, construction progress status and project approval documents to anyone who wants the information.

One-PMIS & Construction Allimi & User Linkage Diagram



- Data stored in Construction Allimi is provided to citizens by taking a database connection after One-PMIS collects the construction information entered by the person in charge of construction and the connection information sourced from related systems.
- Construction Allimi opens the construction site information of 3,500 cases registered in One-PMIS on a real-time basis to citizens. It also provides a portal service that provides a wide range of information about the construction sector.
- Construction Allimi can search for a construction project on the basis of location information and can provide a detailed search service based on various criteria like construction classification, construction amount, client classification and construction name.
- In addition, Construction Allimi can display a wide range of construction work-related data such as process status, contract information, and photos of construction sites. For each construction project searched by the user, it can provide news and statutory information in the construction sector, and also serve as a request window for examination on a construction work-related specific construction method.
- All of the information described above has been opened to citizens through Construction Allimi and the citizens of Seoul visited Construction Allimi 60,213 times (5,018 times a month on average) during the year 2017.
- When you look at the block diagram, the supervisor, and the constructor manage the business using One-PMIS and the primary information is opened to citizens through Construction Allimi. In addition, citizens can leave opinions through Construction Allimi, and the client (SMG) provides the feedback on the opinion.
- Construction Allimi compares and displays the photos before and after the primary construction projects of Seoul to share construction history information. It also provides information for each sector such as construction-related laws, enforcement ordinances, enforcement regulations, ordinances, etc.
- Construction Allimi also shows information regarding the basis for the establishment of the Seoul Metropolitan Infrastructure Headquarters, subcontracting, civil engineering, architecture, facilities, urban railway, contract, budget, accounting, expenditure, property management, One-PMIS, e-Direct Payment, duties of civil servants, and Congress.



Information Provided by Construction Allimi

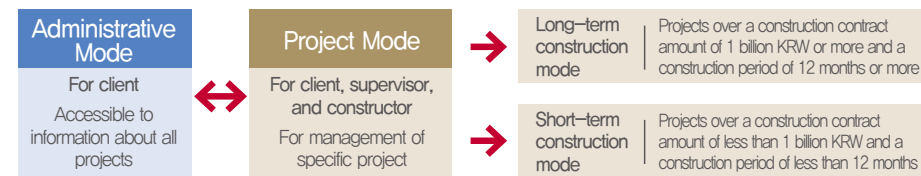
- ① Map search ② Construction progress status ③ Safety information
- ④ Construction information ⑤ Construction Gunggeumi (Civil complaint portal)

4. Menu Organization System of CCS

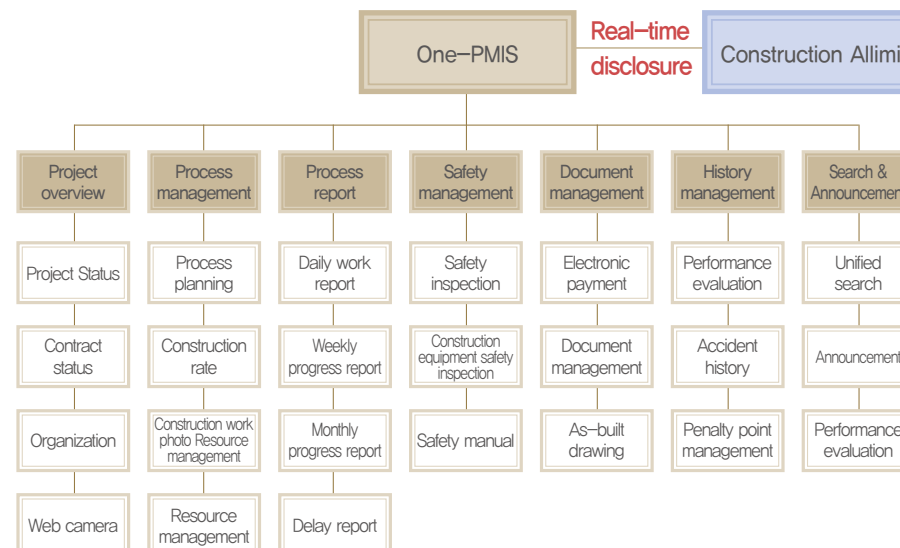
4-1. One-PMIS

- One-PMIS is segregated based on the nature of the project and users and is served by category and menu. Firstly, the mode of One-PMIS is divided into administrative mode and project mode according to the users. The project mode is also divided into long-term construction mode and short-term construction mode according to project scales and time periods.

- The administrative mode is only for a client. The system is designed to perform a role of the client and can gain access to information about all projects, rather than about a specific project.
- The project mode is focused on a specified project. The client, the supervisor, and the constructor can use the project mode and the client can easily switch between the administrative mode and the project mode with a one-time login. Furthermore, the project mode is divided into long-term construction mode and short-term construction mode according to construction contract amounts and construction periods.
- This optimizes the configuration of One-PMIS, according to the respective agents of use and project characteristics, thereby improving user convenience. In addition, the system designs for the respective agents of use are clearly separated to reduce the number of system errors and to be advantageous in preventing infringement of security.



- One-PMIS includes seven categories and 24 menus. When a user logs on to One-PMIS, he or she can identify the seven categories displayed on the main screen and can check the 24 menus when selecting the respective categories.



4-2. Electronic HR Management Scheme

- Electronic HR Management Scheme connects Electronic HR Management System of the Construction Workers Mutual Aid Association under the Ministry of Employment and Labor to SMG's One-PMIS to display information about construction workers on One-PMIS.
- Users can view the attendance status of construction workers and status per occupation on the 'Worker History' menu of One-PMIS (progress report status → resources status → worker history).

The screenshot displays a web application interface for managing construction workers. It includes a sidebar with navigation menus like '공정보고현황' and '근로자이력조회'. The main area shows a table of worker information, including names, IDs, and attendance records. A detailed view of a specific worker's history is also visible, showing dates and locations.

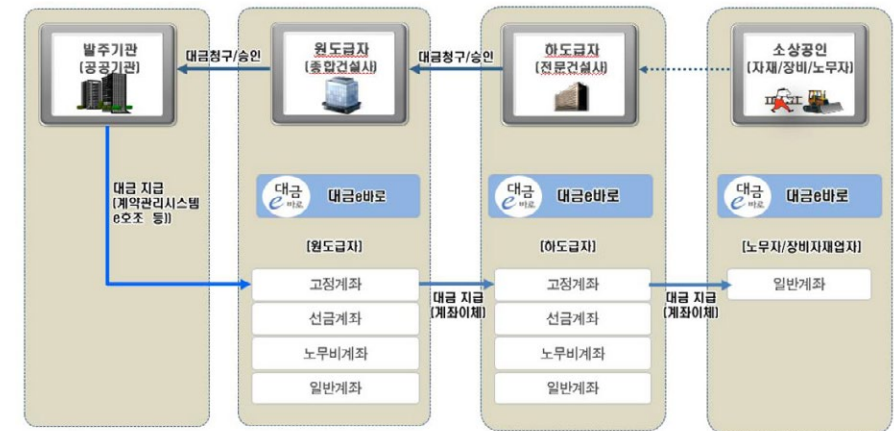
4-3. E-Baro (e-Direct payment) System

- The payment process is as follows.

- A subcontractor bills a contractor for a share of the material and equipment costs and labor expenses.
- The contractor approves the subcontractor's billing and sends a bunch of the contractor's bills to an ordering body.
- The ordering body reviews the breakdown of payment (i.e. share for contractor, share for subcontractor, material and equipment costs, labor expenses) for appropriateness and omission and then approves them.

- The ordering body pays the total amount to the contractor through the e-Baro account (in case of direct payment to the subcontractor, the payment is made to the contractor and the subcontractor separately).
- The contractor and the subcontractor withdraw their shares based on the breakdown approved on e-Baro and transfer the material and equipment costs and the labor expenses accordingly.

■ Organization of e-Direct Payment



☞ Transfer to an individual account based on a recognized billing history (account withdrawal restriction uncton) to guarantee separate payment

- The menus of e-Baro are arranged in the order of business process as shown below. The system allows for a guarantee of payment (subcontract price, labor expenses, equipment and material costs), real-time monitoring of the payment status, and automation of payment verification tasks.

The screenshot shows the E-Baro system interface. It includes a header with the Seoul Metropolitan Government logo and the title '서울특별시 도시개발공사 서울 E-Baro'. The main area displays a '빠른 업무 메뉴' (Quick Business Menu) with various icons for different functions. Below the menu, there is a section for '계약 선택' (Contract Selection) showing a table with columns for '계약번호' (Contract Number), '계약금액' (Contract Amount), '잔액' (Balance), and '잔액비율' (Balance Ratio). The table shows a contract with a balance of 10 and a balance ratio of 0%.

4-4. Construction Allimi

- There are seven menus at the top of the main screen of Allimi website, and icons are arranged on the left side which allow for the users to search for construction projects including roads, building, urban railway projects based on construction project classification.
- At the center of the main screen, users can search for construction projects on the map of Seoul for each administrative district (25 boroughs) and on the right side of the screen, there is a detailed search function where users can search for a construction project name, an ordering body, project classification, data, etc. A construction project search menu is provided at the top of the screen, accessible from all pages, thereby further improving accessibility for users to search for construction projects.
- The bottom of the screen displays information on the five most searched construction projects. Shortcuts to construction photo, contract status information, news, example cases, etc. are provided at the bottom left and a citizen participation function like civil complaint guidance is provided at the bottom right.
- Construction Allimi has a menu for guidance on mobile, electronic, and telephonic channels for civil complaint.
 - Guidance on mobile civil complaints provides measures to file complaints using smart phones and to communicate with SMG via social networking service (SNS).
 - Guidance on electronic civil complaints introduces SMG's integrated civil complaint handling mechanism ("Eungdapso") and "Ask the Assistant Mayor" feature (civil complaint boards operated by Seoul Metropolitan Infrastructure Headquarters).
 - Guidance on telephone civil complaints provides a menu for subcontract corruption report and searching construction manager.

Allimi website (top)

User Citizens (no membership required)

Disclosed project information Ongoing construction projects ordered by SMG and construction projects completed within 3 months Contents per menu

Content of Menu Organization

- Seven main menus, 16 submenus, and two pop-up menus
- Search by Field
- Search by Administrative District

- Detailed search by item provided
- Construction project search function available at all times, on all pages



Allimi website (bottom)

User Citizens (no membership required)

Disclosed project information Ongoing construction projects ordered by SMG and construction projects completed within 3 months Contents per menu

Content of Menu Organization

- Information on five most searched and five latest construction projects
- Submenus of interest (construction site photo, contract status, safety data room, construction information news, latest news, and model cases of safety inspection)
- Citizen participation menus such as application for construction site tour, "Ask the Assistant Mayor", guidance on civil complaints, etc.



4. Menu Organization System of CCS

- Location search function allows for citizens to designate locations directly on the map to search for construction projects near a corresponding area. For reference, Construction Allimi uses the map Application Program Interface (API) of DAUM Internet portal service free of cost and recalculates longitude and latitude coordinate values based on the map API when connected to other systems, thereby providing an effective service.

Map search function – Detailed search



Detailed search : Provide a detailed search service based on administrative districts, construction names, ordering institutions, project classification (roads, public buildings, water systems, etc.), amounts of money, information (construction period extension, design changes, penalized companies and settlement documents) on the map.

Map search function – Location search



Location search : Designate a location on the map directly to search for a construction project near a corresponding area
DAUM map API (for free) used as the map
Maintain compatibility with other map services through recalculation of the longitude and latitude coordinates

Construction project information search



Enter construction project information (construction names, ordering institutions, project classification, etc.) to search for the project.
Select a corresponding project from a search result of ① list or ② map

Detailed construction project information – Construction site photos



Recent 10 construction work photos by construction projects
① Provided in slide format ② Construction photo name and registration date

Detailed construction project information – Project overview



Construction project overview information entered to One-PMS disclosed.

Detailed construction project information – Participant status



5. Success Factors of CCS

5-1. SMG's strong commitment

Decision-Maker's Strong Commitment

In order to achieve transparency and efficiency, political will and drive from the top to construct the system and to enforce its use are crucial. Resistance inevitably follows a change in public construction culture. Thus, a successful introduction of a system like CCS depends on the willingness of the decision-maker to push forward the initiative. The decision-maker's decision was the key factor that enabled SMG and project participants to adapt to changes in work environment derived from the introduction of CCS.

Encouragement of User and Citizen Participation

A user-centered, bottom-up approach and participation through civil consultation facilitated the system development, implementation, and upgrade. SMG's experience shows that the best solutions derive from citizens and users.

Interest in Social Issues

SMG empathized with construction workers who were marginalized due to delay in payment. Above all, SMG had affection towards those who are socially vulnerable (e.g. workers, those with disabilities, the elderly, child breadwinners, low-income family) and strong will to tackle social problems.

Systematization of Payment Structure

SMG tried to build a system that allows for construction costs to safely reach construction workers, or the final receivers of the payment. SMG felt the need to systematically prevent the misuse of construction costs during the course of the payment being made by the ordering body reaching the final receivers via contractors and subcontractors.

5-2. SMG's Efforts on Improving Public Administration System

○ SMG's Information Disclosure

SMG has established a department in charge of the public information disclosure to lead the administration of Seoul under the motto of “innovation and cooperative governance,” with information disclosure and sharing, and cooperation as the base of Seoul's policy evidenced by SMG's “nude project.” There were some confusion and problems in the early stage of the project. However, although being against the laws, every trivial policy information is disclosed now and is now available for citizens through the public website anytime on a real-time basis.

○ Changes in Construction Project Processing Method through Public Construction Management System

“CCS” has been constantly evolved and developed to improve the transparency of construction sites and manage public construction projects efficiently. This evolution also changed the business processing method for public construction management. Minimizing an unnecessary direct contact between construction management officials and interested parties on the construction sites is essential for prevention of corruption.

The systematic on-line sharing (real-time disclosure of business report and status such as field materials, design changes, and quality and safety management to citizens) of documents and information in all sectors related to construction business can enable system users to have better understanding of the overall management process, thereby reducing the risk of corruptive acts.

○ Strengthening of responsible culture and reduction of social conflict through information disclosure

Provision of real-time construction information can enable all the participants to be aware that the information is open to the public, strengthening citizens' surveillance of administrative procedures. It can also contribute to the creation of responsible and transparent culture in the management of construction projects.

5-3. Sharing of CCS and promotional activities

○ Hosting of international workshop with 20 countries

- SMG and United Nations Development Programme's Seoul Policy Centre (USPC) held the workshop on “public construction transparency” from December 2 to 4, 2015 with 70 participants from 20 developing countries. Participants include Korean and foreign public officials, representatives from the Construction Sector Transparency Initiative (Cost), UNDP, Ministry of Foreign Affairs, Anti-Corruption & Civil Rights Commission, Public Procurement Service, system experts, Korea Specialty Construction Association (KOSCA).
- Introduction of Best practices
 - System : Construction Allimi, One-PMIS, E-Baro system, and Electronic HR Management Scheme
 - Policy : Information Disclosure Policy, Anti-Corruption Transparent Administration Policy, Experience of Operating CCS



Group Photo



Mayor's Keynote Address

○ Selection of Partner Countries of Participants from Workshop Participating Nations

- Developed a consensus with many countries with regard to the importance of integrity in the construction sector upon the workshop, and eleven countries submitted proposals to learn from the system.
- Started a DSP project with five countries (Vietnam, Thailand, Ukraine, Jordan, and Uganda) among the countries that submitted the proposal with USPC's support of seed funding and SMG's technical advisory support.

○ Mission to Three Countries for Sharing of “CCS”

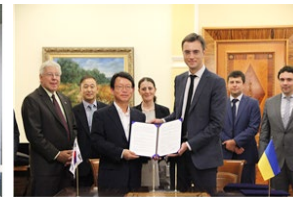
- One of five countries, SMG and USPC visited Vietnam, Thailand, and Ukraine on July 2016 and attended high-level meetings and local workshops to provide in-depth technical advice.
- In particular, SMG signed Memorandum of Understanding (MOU) for mutual cooperation with Da Nang City in Vietnam and Ministry of the Infrastructure of Ukraine to start a practical cooperation for promotion of Seoul’s “CCS”.
- In the MoU ceremony with partner countries, the Mayor of Da Nang City, Vietnam and the Minister of the Infrastructure of Ukraine signed the MoU with Seoul Mayor’s congratulatory video message presented.



MOU with Da Nang



Mayor’s Celebratory Video



MOU with Ukraine

○ Participation in ‘United Cities and Local Governments (UCLG)’ and ‘United Nations (UN) Habitat 3’ and Promotional Activities

- Attended the UCLG Asia-Pacific Congress held in Gunsan, Jeollabuk-do in September 2016 and promoted “CCS” in the PR booth for Seoul, and promoted “CCS” to the people around the world during the “Seoul Session” of UCLG World Congress held in Bogota, Colombia, and of UN-Habitat 3 held in Quito, Ecuador, in October, 2016.



UCLG Asia-Pacific Congress



UCLG World Congress



UN Habitat 3

○ Hosting of Workshop for Vietnam and Ukraine

- Invited two countries, Vietnam and Ukraine that showed some tangible progress in developing CCS-like mechanism and held the workshop to provide more specific and in-depth technical advice on their system.
- The workshop was the product of collaboration among three institutions: SMG’s Global Urban Partnership Division; SMH; and USPC. As a result, two participating countries could find a way to better develop localized version of CCS.



Vietnam Delegation



Ukraine Delegation



Group Photo

○ UNDP Study Visit for High-Level Officials and Promotional Activities

- Shared CCS with foreign officials from Kiev, Ukraine, during the training programme hosted by Seoul Human Resource Development Center at SMH in February 2017.
- Co-hosted study visit for high-level officials with USPC in March 2017 to share the policy with senior officials from Afghanistan and Tunisia, leaving remarkable impression.

Tunisian Anti-Corruption
Chairman (Left) and Assistant
Mayor (Right)

Group Photo



Workshop

○ Visit by the Thailand Government Delegation to SMIH and Hosting of Workshop

- The Comptroller General of Thailand, among the five DSP partner countries on CCS, visited SMIH in April 2017, and SMG held the workshop providing technical advice and detailed information on menus and operations of the system.



Group Photo



Workshop

○ Participation in UN High-Level Political Forum

- UN high-level political forum was held in the UN Headquarters, New York, in July 2017, with the participation of high-level officials around the world. SMIH participated in the side event regarding the sustainable development hosted by the UNDP to share the policy with the representatives from many countries, Transparency International, Anti-Corruption & Civil Rights Commission and received attention especially from the Transparency International.



UN High-Level Political Forum



○ Organization of Video Conference with Uganda Officials and CSOs

- UNDP's Seoul Policy Center and SMG held the video conference (Webinar) for “CCS” business cooperation with Kampala, Uganda, in July 2017. In Uganda, Kampala and the Anti-Corruption Citizen Alliance are pushing forward the business in cooperation with each other.

○ Visit by the Minister of Infrastructure of Ukraine and Hosting of Workshop

- The Minister of Infrastructure of Ukraine visited SMG and SMIH in September 2017, and had high-level bilateral meetings with the Mayor, Vice-Mayor and the Assistant Mayor.
- In addition, SMG held the workshop for CCS knowledge exchange with Ukraine delegation at SMIH, and provided technical advice required for the system design of Ukraine version by demonstrating One-PMIS and Construction Allimi.



Group Photo



Photo with Ukraine Minister



Webinar with Uganda

○ Project Performance

- Promoted development of contextualized system for each country by sharing the policy and technical advice with the five partner countries.

| Country Name | Progress |
|--|---|
| Thailand (Audit Department) | <ul style="list-style-type: none"> – Complete construction of “Thai Allimi” in order to open information to citizens and expand their participation – Secure an initial reserve of \$ 50,000 (supported by UNDP) and a government budget of \$ 150,000 |
| Vietnam (Da Nang) | <ul style="list-style-type: none"> – Complete construction of “Da Nang Allimi” by integrating the construction management system of Da Nang with CCS – Transfer to an initial reserve of \$ 100,000 (supported by UNDP) and self-informatization business budgets |
| Ukraine (Infrastructure Department) | <ul style="list-style-type: none"> – Composed Working Group led by the Vice Minister, completed the initial design of the system and allocated budget (2016–2017) – Established CCS-like system to enhance efficiency and transparency of the construction projects (2018) – Utilized \$100,000 of seed funding from USPC and \$352,000 of government budget |

| Country Name | Progress |
|--|---|
| Uganda (Kampala Capital City Authority) | <ul style="list-style-type: none"> – National development plan set enhancing the transparency of “Infrastructure Sector” within the public policies as a priority – “Uganda Allimi” system was established with a close cooperation between Kampala Capital City Authority and the civil society (from 2016 to 2017) – An initial seed funding of \$105,000 (provided by USPC) |
| Jordan (Ministry of Public Works and Housing) | <ul style="list-style-type: none"> – Established a “Construction Sector Surveillance and Monitoring System” with the Jordanian Integrity and Anti-Corruption Commission playing the central role – An initial seed funding of \$ 50,000 (provided by USPC) |

5-4. Expanding the partnership to share CCS with foreign partners

○ Selecting and Supporting Two Additional Countries with whom CCS will be shared

- In December 2017, SMG and UNDP Seoul Policy Centre (USPC) decided to select additional countries and share SMG’s CCS policy tool, based on the tangible country-level results gained from the previous project where CCS was shared with five countries in past two years.
- In January 2018, USPC additionally selected two countries (Tunisia and the Philippines) as partner countries for sharing CCS and offered each country a seed funding of \$50,000. SMG decided to share CCS experience and policy knowhows learnt from the enforcement of the policy.

○ Hosted a Video Conference with Tunisian Government, Parliament and CSOs

- In March 2018, the Seoul Metropolitan Infrastructure Headquarters co-hosted a video conference (Webinar) with USPC, Tunisia government institutions (the National Agency Against Corruption, and Ministry of Local Affairs and Environment) and UNDP Tunisia Country Office to support the implementation of CCS in Tunisia

- Many Tunisian stakeholders participated in the webinar and expressed strong interest. Participants include: administrative, legislative officials from various government institutions (e.g. National Agency Against Corruption, Presidency of the Government, Ministry of Local Affairs and Environment, Parliament, etc.) as well as experts from private sectors and CSOs.
- During the conference, SMG emphasized that “CCS is an effective policy tool that can secure the transparency and integrity of the public construction sector through efficient management of construction information and disclosure of such information to the public.”
- The Tunisia partners expect that as SMG’s CCS methodology is in line with the Tunisia Government’s national approach to improving transparency, responsibility and civic participation, SMG’s CCS experience can be adapted to the improvement of the Tunisian system.



Welcome remarks delivered by the Head of the Seoul Infrastructure Headquarters



Webinar



Group Photo of Participants

○ Hosted a Video Conference with Philippine Government, Enterprises, etc.

- In March 2018, the Seoul Metropolitan Infrastructure Headquarters co-hosted a video conference with USPC, Philippine Government (the Department of the Interior and Local Government, DILG), and the UNDP Philippines Country Office and shared SMG’s experience and knowhows with the Philippine Government partners to support the improvement of their Anti-Corruption policy tools.
- From the Philippine Government’s side, the vice-minister and the general manager of DILG participated in the video conference. Google, a global IT company also joined the conference and expressed interest in how SMG has been upgrading its existing CCS.
- The Vice-minister of DILG explained that Philippine aims to enhance the anti-corruption efforts within the existing construction management system by establishing a system similar to SMG’s “Construction Allimi” by benchmarking Korea’s CCS to enable citizens to monitor and track the details of construction projects.



Welcome remarks delivered
by the Head of the Seoul
Infrastructure Headquarters



Webinar



Group Photo of Participants

○ Holding MOU and Invitation Workshop with the Philippines DILG

- 2018. In July, the SMG and the Philippines DILG signed the business agreement for the 'Clean Construction System (CCS) Sharing and Cooperation', and held a workshop in Seoul for sharing the experience of constructing CCS and policy advisory.
- From the Philippines, the advisor to the DILG Minister, two governors, interested parties of the Local Government Association, Google, UNDP Philippines and others participated in the event showing their interest in SMG policies.
- As a result of the workshop, the delegation got ideas for constructing and designing a realistic system for their country that is similar to the CCS of SMG, and decided to introduce the CCS by designating two regions as model areas.



Commemorative photograph
with participants from the
Philippines



MOU with the Philippines DILG



One-PMIS Presentation

○ Holding MOU and Invitation Workshop with the Tunisian Government

- 2018. In May, the SMG and the Tunisian Anti-Corruption Agency, and the Ministry of Local Affairs and the Environment signed the business agreement for the 'Clean Construction System (CCS) Sharing and Cooperation', and in September held a ceremony in Seoul for exchanging the MOU, and held a workshop for sharing the experience of constructing CCS and policy advisory.
- Advisor to the President of Tunisia, the Director of the Ministry of Local Affairs and the Environment, an investigator from the Tunisian Anti-Corruption Agency, three mayors of the Djerba region, and others participated in the workshop.
- Tunisia plans to introduce the SMG policies to three cities of Djerba by designating them as model areas, and increase the transparency and integrity of the construction administration to help the system users and civil society and trust the system and take an interest in it.



Commemorative photograph
with the three mayors of the
Djerba region



MOU Exchange Ceremony with
Tunisia



Group photograph of the Tunisia
Workshop

6. Recognition of CCS in Korea and Overseas

Received Awards and its Significance

- UN Public Service Awards (UNPSA) is the most prestigious international awards in the public service sector. “CCS”, an anti-corruption policy tool, won the excellence award in the “Preventing and Combating Corruption in the Public Service Category” in 2013.

Winning the UNPSA is the result of Seoul’s strong commitment to eradicate corruption in the construction site, the introduction of a transparent information management system using excellent computer technology, and the active participation of stakeholders. and by winning the prestigious UN award, the excellence of CCS has been recognized throughout the world.

- In 2015, Transparency International Korea selected the “e-Direct Payment” system as the winner of the transparent society award of the Year on December 9, which is the UN “Anti-Corruption Day.” Transparency International Korea stated that the reason for awarding the “e-Direct Payment” system is because “the system

significantly promoted win-win cooperation and enhanced the transparency of construction sites by disbursing construction payments per categories and ensuring that the payment will be disbursed. This prevented subcontractors or workers from not receiving the construction payment or suffering from delayed payment of wages.”

- Seoul’s “CCS” was selected as the winner of the Public-Sector ICT Excellence Award in the World Information Technology and Service Alliance (WITSA) Global ICT Excellence Award in 2016. In the World Congress on Information Technology (WCIT), WITSA evaluated that Seoul’s “CCS” is a very innovative service which combines construction business and IT service that displays excellence in openness, innovation, and integrity.
- Moreover, Seoul’s “CCS” won the 2016 Human Technology Award (Construction Allimi), the 2017 Asia-Pacific Stevie Award (e-Direct Payment), etc.



Foreign June 2013
“CCS” UNPSA
“Public Service Corruption Prevention”
Won Sector Excellence Award



Domestic December 2011
“e-Direct Payment”
“2011 Public Information Grand Prize Contest”
Won Prime Minister’s Award



Domestic September 2013
“CCS”
Korea IT Innovation Grand Prize
(Won Ministry of Science, ICT and Future Planning, Minister’s Award)

October 2016 Foreign

“CCS” won the Excellence Award in the Global ICT Public-Sector



November 2014 Foreign
“CCS”
“Guangzhou's International City Innovation Award”
Selected as Expert-Recommended Excellent Project.



December 2015 Domestic
“e-Direct Payment” won the 15th Transparent Society Award Sponsored by the Transparency International Korea.



June 2016 Domestic
“Construction Allimi” won the Excellence Prize at the Human Technology Award in the Society and Public Sector.

Publicizing CCS in Korea and Overseas

(Presenting CCS as a Best Practice)

| | |
|----------------|--|
| October 2012 | FutureGov Forum: About 160 participants from 20 countries |
| October 2012 | East Asia Senior Official Forum: About 1,000 Senior Officials |
| November 2012 | Global Forum on Fighting Corruption in Brazil: About 1,000 participants from National Organizations and NGOs around the world |
| June 2013 | Received the invitation from the City Hall, Edmonton, Canada and publicized the system: 300 Canada Officials |
| November 2014 | International Forum of Urbanism in Guangzhou: About 1,000 participants from 149 cities in 62 countries |
| January 2015 | Presented CCS as a “Best Practice” in UNDP’s International Anti-Corruption Conference (IACC) |
| May 2015 | World e-Governments Organization of Cities and Local Governments (WeGO) Joint International Jeju Forum: About 1,000 participants from around 30 countries |
| December 2015 | SMG (Seoul Metropolitan Infrastructure Headquarters) and USPC Jointly hosted an International Workshop: About 120 participants from 20 countries |
| December 2015 | Participated in the local workshops in three countries (Vietnam, Thailand, and Ukraine) and conducted PR activities: About 120 participants from three countries |
| 2015–2016 | Presented CCS as a “Best Practice” in the Conversation Session of International Organizations in Seoul |
| September 2016 | Held exhibition and conducted PR activities in the United Cities and Local Governments Asia-Pacific (UCLG ASPAC) in Gunsan: About 650 participants from 36 countries |

| | |
|---------------|---|
| October 2016 | Conducted PR activities in the Seoul Session of the World Congress of the United Cities and Local Governments (UCLG) in Bogota: About 200 participants |
| October 2016 | Conducted PR activities in the Seoul Session of UN Habitat III Congress: About 150 participants |
| July 2017 | Presented CCS as a “Best Practice” at the side event of the UN high-level political forum: About 70 participants from the International Anti-Corruption Alliance, government representatives, international organizations, etc. |
| November 2014 | Foreign “CCS” was Selected as Expert-Recommended Excellent Project In the 「Guangzhou's International City Innovation Award」 |
| December 2015 | Domestic “e-Direct Payment” won the 15th Transparent Society Award Hosted by the Transparency International Korea. |
| June 2016 | Domestic “Construction Allimi” won the Excellence Prize at the Human Technology Award in the Society and Public Sector. |
| October 2016 | Foreign “CCS” won the Excellence Award in the Global ICT Public-Sector |

Annex History of CCS



2011

- Newly established an Construction Information Management System(One-PMIS)
: Integrated Rapid Transit Bureau's PMIS, Facilities Bureau's C-PMIS, systems used in Districts, and Investment Institution's T-PMIS
- Newly established a Real-Time Subcontract Payment Identification System (e-Baro) [First Time in Korea]

2012

- Signed the Agreement with the Transparency International Korea for Construction Information Management System (One-PMIS) and e-Baro system
- Operated Construction Allimi website and Construction Allimi mobile app
- Signed the Partnership Agreement with the Financial Institutions (Woori Bank, Industrial Bank of Korea (IBK)) for e-Baro system
- Expanded the application of Real-Time Subcontract Price Payment Identification system(e-Baro) to the Construction Sites of Seoul
- Established 「e-Baro」 (added Functions that identify the payment of Wage, Equipment and Material Costs)
- Expanded Financial Institutions Participating in e-Baro and Signed with the Agreement with Them (Kookmin Bank, Nonghyup Bank)
- Changed Name of e-Baro system (Subcontract Payment Identification System ⇒ 「e-Baro」)



2013

- Implemented e-Baro system in the entire Ordering Body within SMG (25 Districts, Investment Institutions, etc.)
- Amended the Seoul's Ordinance Regarding e-Baro [Article 7 of the Ordinance on the Fair Subcontracting and Win-Win Cooperation]

2014

- Acquired the Patent Regarding Construction Information Management System (One-PMIS) [Title of Invention: Integrated Construction Information Management System]
- Upgraded Functions of 「e-Baro」



2015

- Improved the Construction Allimi System: Display Latest Construction Issues, and linking Allimi with Other Systems
- e-Baro: Signed the Agreement with Participating Financial Institutions [Six Banks including Shinhan Bank, Hana Bank, Korea Exchange Bank, etc.]
- SMG and USPC jointly held an International Workshop Regarding "Public Construction Transparency."

2016

- Signed MOU with Da Nang City in Vietnam and the Ministry of Infrastructure of Ukraine to provide Support for the development of "CCS"
- Strengthened Accessibility of Construction Allimi by establishing Responsive Websites, etc. and Restructured Construction Allimi into a Web Portal
- Established Customer Center for "e-Baro", Obtained Patents, Expanded the Number of Banks that signed the e-Baro Agreement (9 Banks) and Restructured the Overall Website



2017

- Established Web Service for Introducing "Construction Information Management System (One-PMIS)" and Specific Products (Construction Methods), Built a Construction Allimi Introduction Website within Seoul's Homepage for Foreigners, and Created a New Content to Disclose Presentation for Residents
- Linked "e-Baro" and Knowledge Information System of Construction Industry (KISCON) (the Ministry of Land, Infrastructure and Transport), and Electronic HR Management System (Construction Workers Mutual Aid Association), and Received/Managed Delayed Payment Reports

Pursuing Innovation by Disclosing Transparent Construction Information

Seoul Clean Construction System

Clean Construction System

| | | |
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