



CM Service for Dongtan II 9th Elementary School Multifunctional Facility and Residents Complex Center

CM Case Study

March, 2017



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Part 1

Introduction of the Project

1.1 | Project Overview

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1.3 | Project View

1.4 | Project Schedule

1.1 Project Overview



Project Overview

Project Title	CM Service for Dongtan 9th Elementary School Multifunctional Facility and Residents Complex Center
Land Location	10 Mok-ri, Dongtan-myun, Hwasung-City, Gyeonggi-do
Land Area	11,003 m ² (817.12 pyeong)
Total Project Cost	21.4 billion won
Project Period	24 Oct 2011 ~ 10 Aug 2016
Client	Hwaseong City Council
Architect	D&B Architecture Design Group
CM Service /Consulting	Mooyoung CM. Co., Ltd.

1.2 Project Background and Purpose

“Establishment of the local education and community connecting include society, school, and people”



“Providing quality educational and public facilities for students and citizens”

1.2 Project Background and Purpose

The first “facility-integrated project” in Korea



“Local Government Self-investment to built-up the School”

Lifelong learning facility of community for after school and weekend

1.3 Project View



Southern



1.3 Project View



1.4 Project Schedule



- 10 Aug. 2016
Completion of Dongtan Central leumteo
- 5 Sept. 2016
Authorization for use of Dongtan Central leumteo
- 30 Sept. 2016
leumteo Library Opening

2016

2015

2014

2013

2012

2011

- 27. Oct. 2011
Setup the new urban school complex TF team
- 28. Nov. 2011
Setup the execution consultative for the school facility complex

- 16. Mar. 2012
Re-structuring of the organization, Establishment of new school facility complex team
- 30. Mar. 2012
Request of the Land use planning adjustment relative to Ninth Elementary School
- 26. Nov. 2012
Approval discussion to change the development and detail plans and feasibility study and concept design plan for school facility complex

- 21. Jan. 2013
Deliberation on establishment plans
- 1. Aug. 2013
Change Notice of Dongtan 2 District Unit
- 21. Sep. 2013
Completed feasibility study and concept design plan for school facility complex

- 29. Apr. 2014
Award of the architecture design contest winner
- 15. Apr. 2014
Commencement of Construction Management
- 12. Aug. 2014
Completion of the facility complex concept and detail design
- 5. Nov. 2014
Facility complex building approval

- 26. Feb. 2015
MOU signing ceremony for the school facility complex and Dongtan Central leumteo groundbreaking ceremony
- 31. Dec. 2015
Confirmation of the name of the composite facility in Dongtan-city(leumteo)



Part 2

Project Characteristics

2.1 | Multiple Participants

2.2 | Multifunctional Complex Facilities

2.3 | Adjacent work for the School and Residential

2.1 Multiple Participants



2.2 Multifunctional Composite Facilities

Lecture Room(5F)



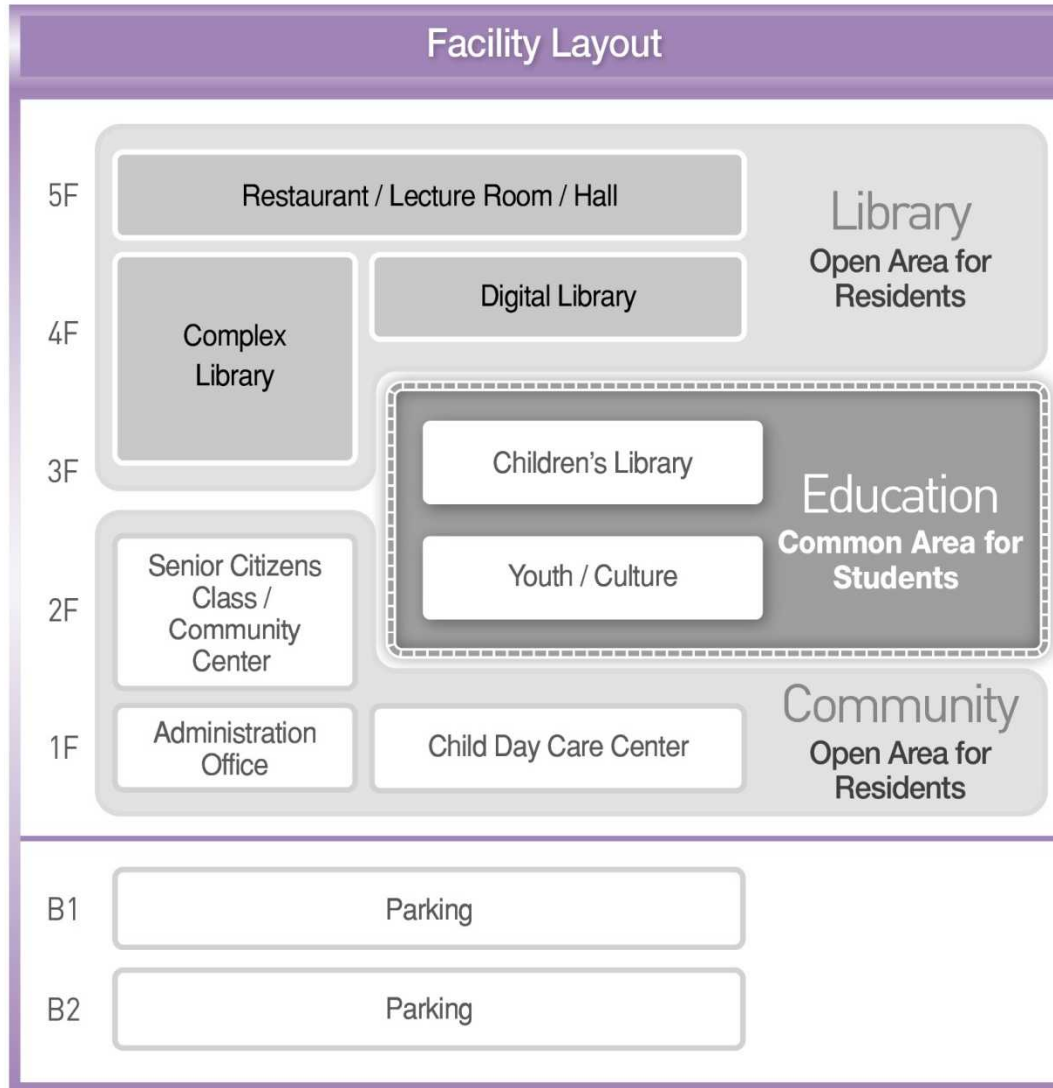
Digital Library(4F)



Children's Library(3F)



Facility Layout



Youth Center(2F)



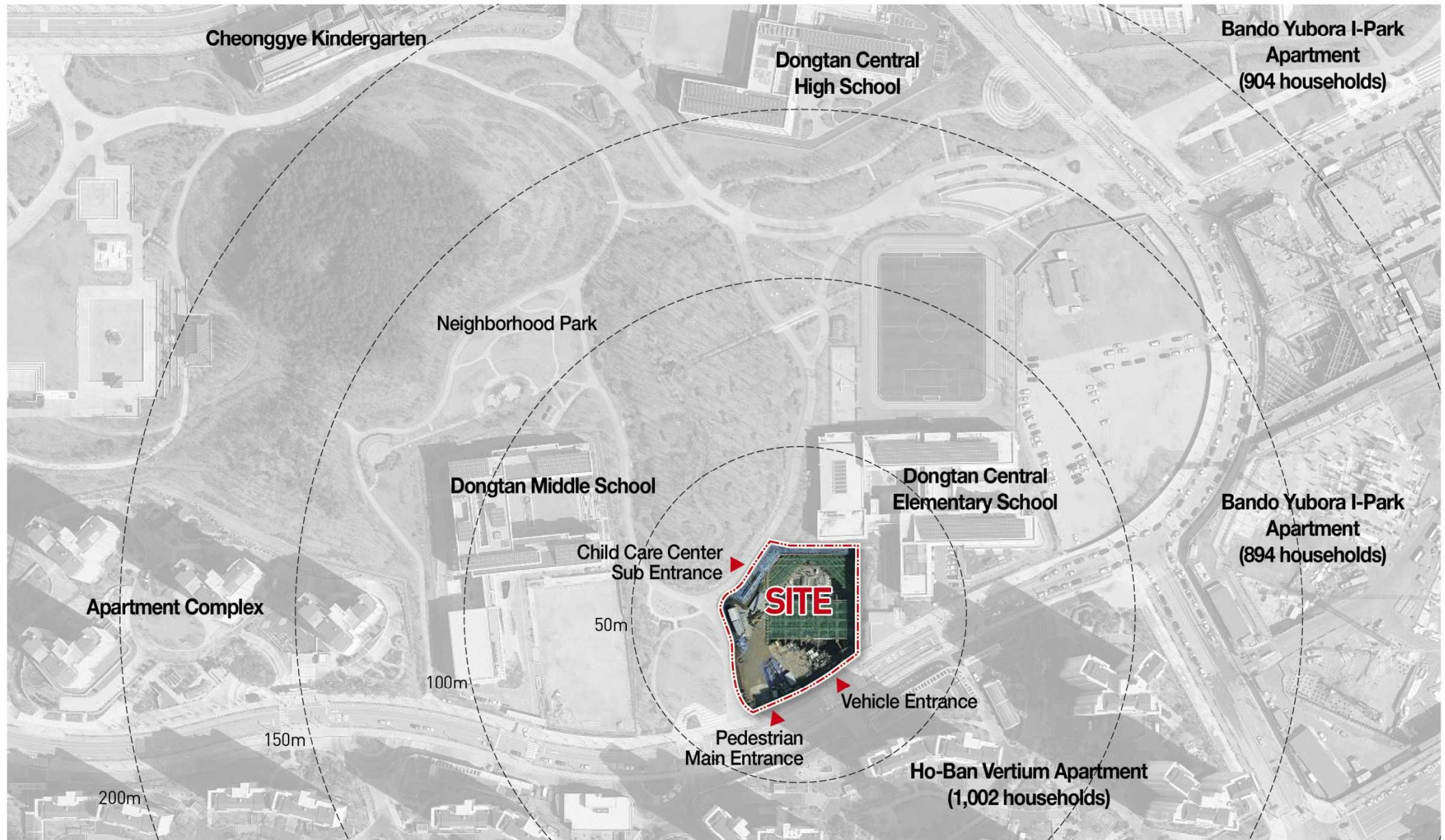
Child Day Care Center(1F)



Parking(B1, B2)



2.3 Adjacent work for the School and Residential



Part 3

Project Management

3.1 | Organization Chart

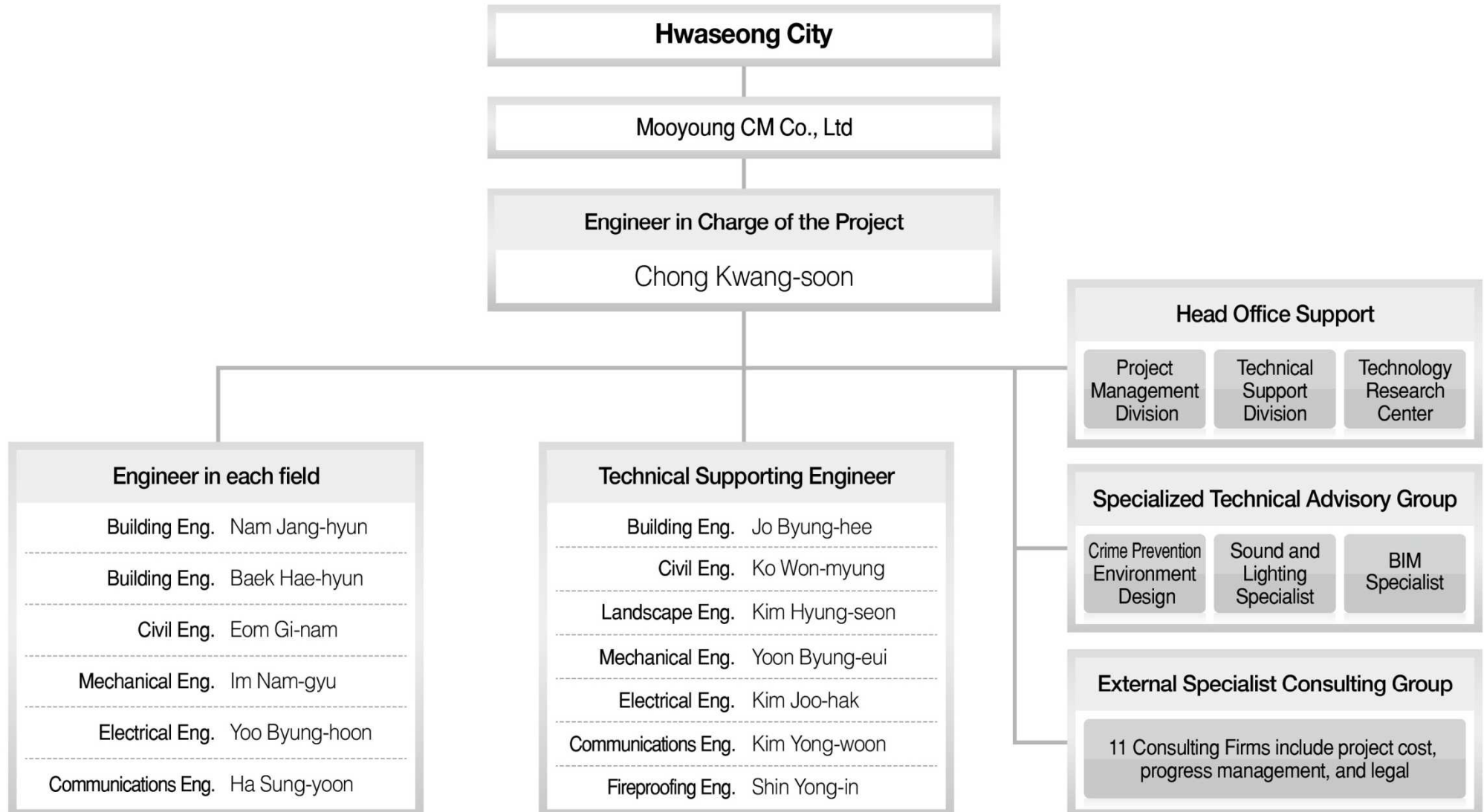
3.2 | CM Execution Detail Schedule

3.3 | Design Management

3.4 | Site Management

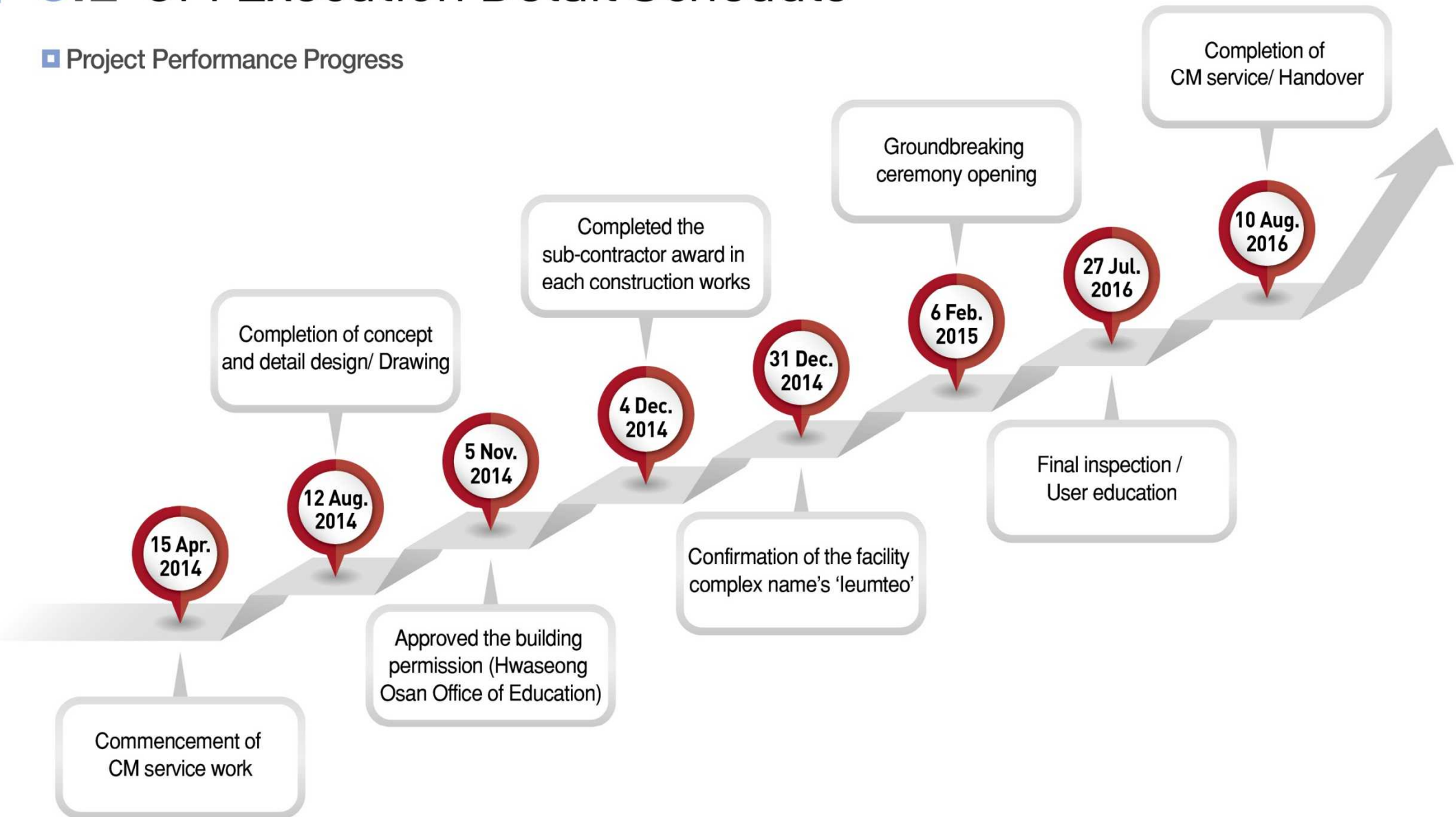
3.1 Organization Chart

CM Organization (Construction Phase)



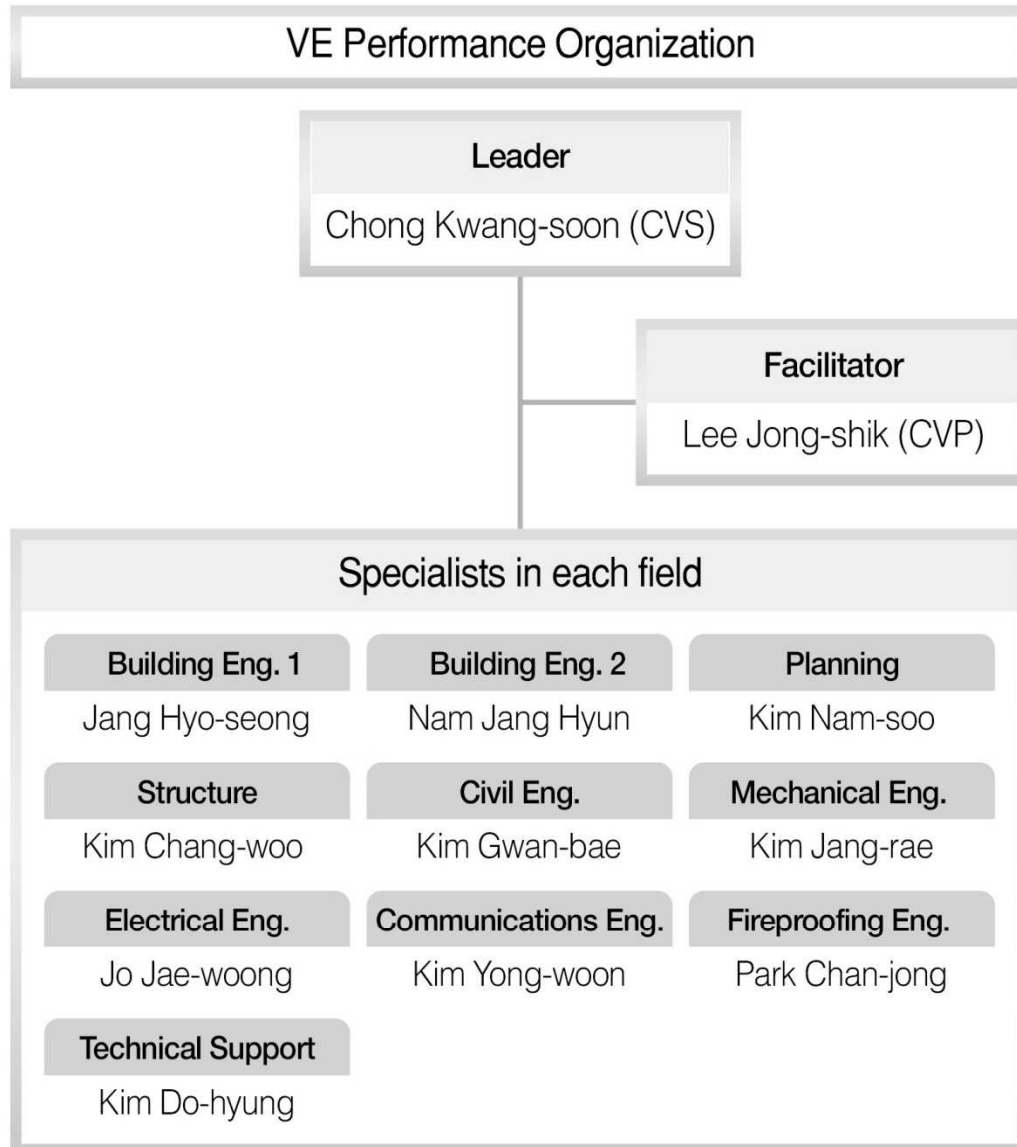
3.2 CM Execution Detail Schedule

▣ Project Performance Progress



3.3 Design Management - VE Performance

▣ VE Performance Organization



VE Proposal Details			
Summary of work type (Unit: million won)			
Category	Number of Cases	Construction cost	Maintenance management cost
Building Eng.	4	23	—
Structure	2	1	—
Mechanical Eng.	4	85	20
Electrical Eng.	3	10	—
Fireproofing Eng.	4	8	—
Communications Eng.	3	385	—
Landscape Eng.	2	2	—
Sub-total	22	514	20

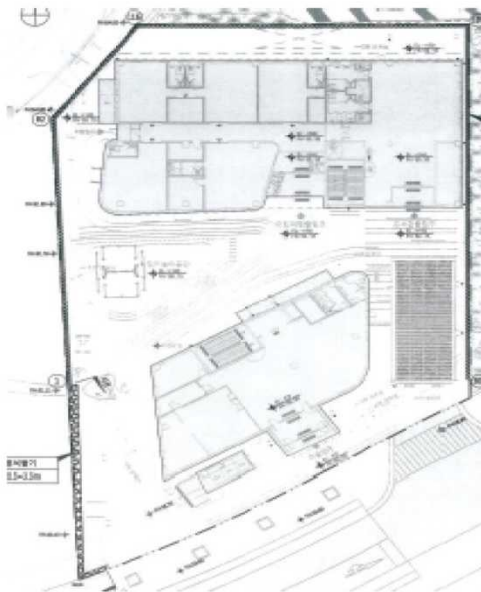
3.3 Design Management - VE Performance

▣ VE Proposal Items

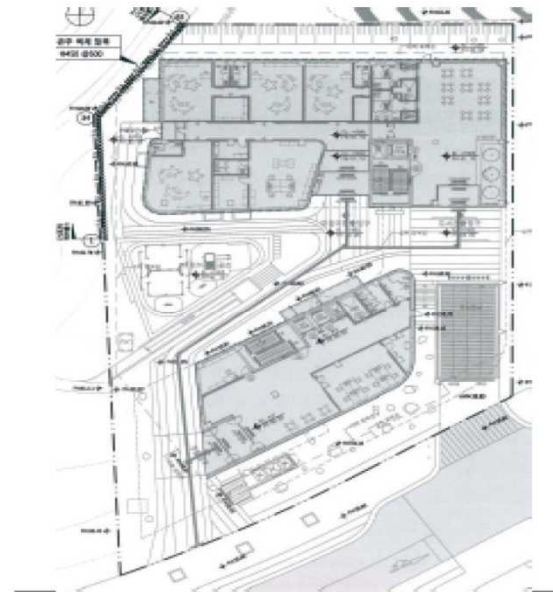
Cost-saving type

Site level adjustment

Before improvement



After improvement



Reduce the construction cost to adjusted total soil volume and height of retain wall

“₩3.4 Hundred million Cost saved”

3.3 Design Management - VE Performance

▣ VE Proposal Items

Value-enhancement type

Change the sprinkler test equipment

Before improvement



After improvement

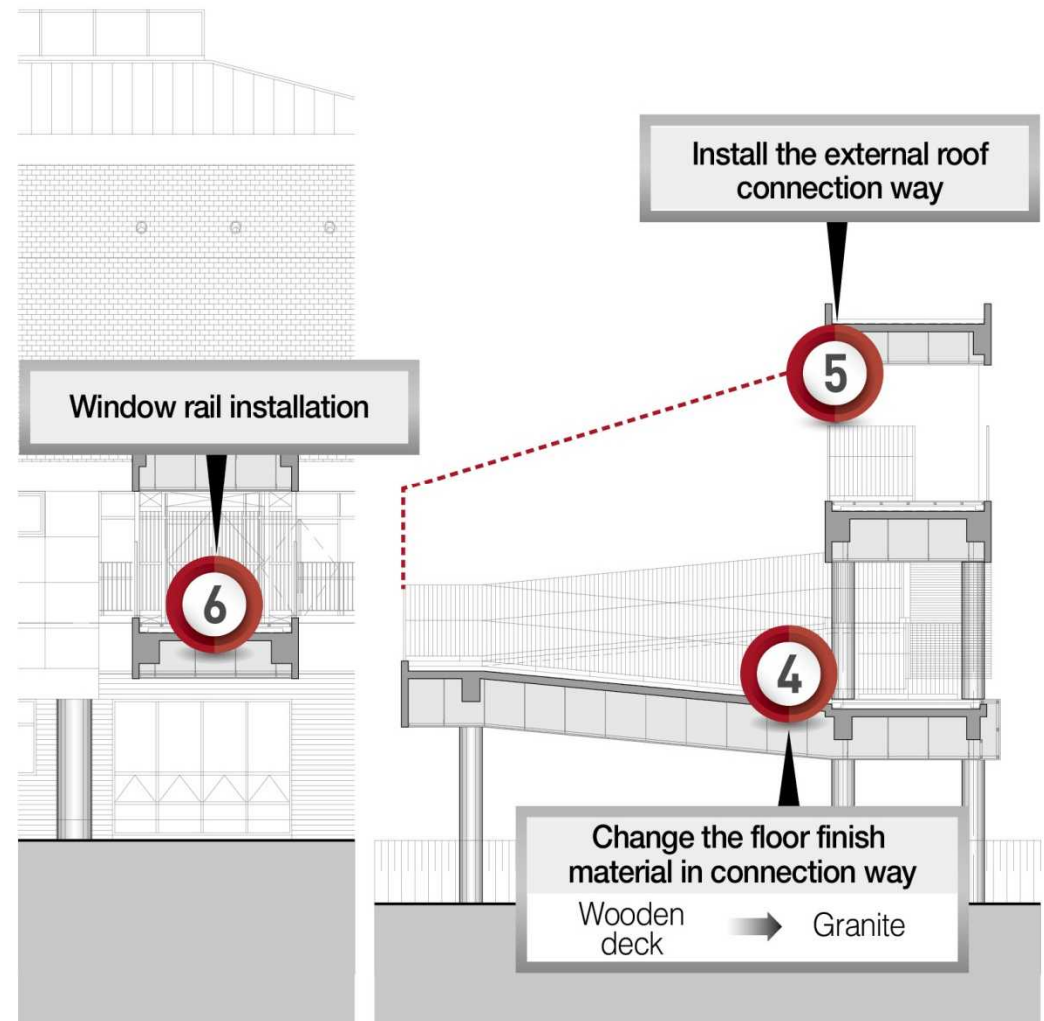
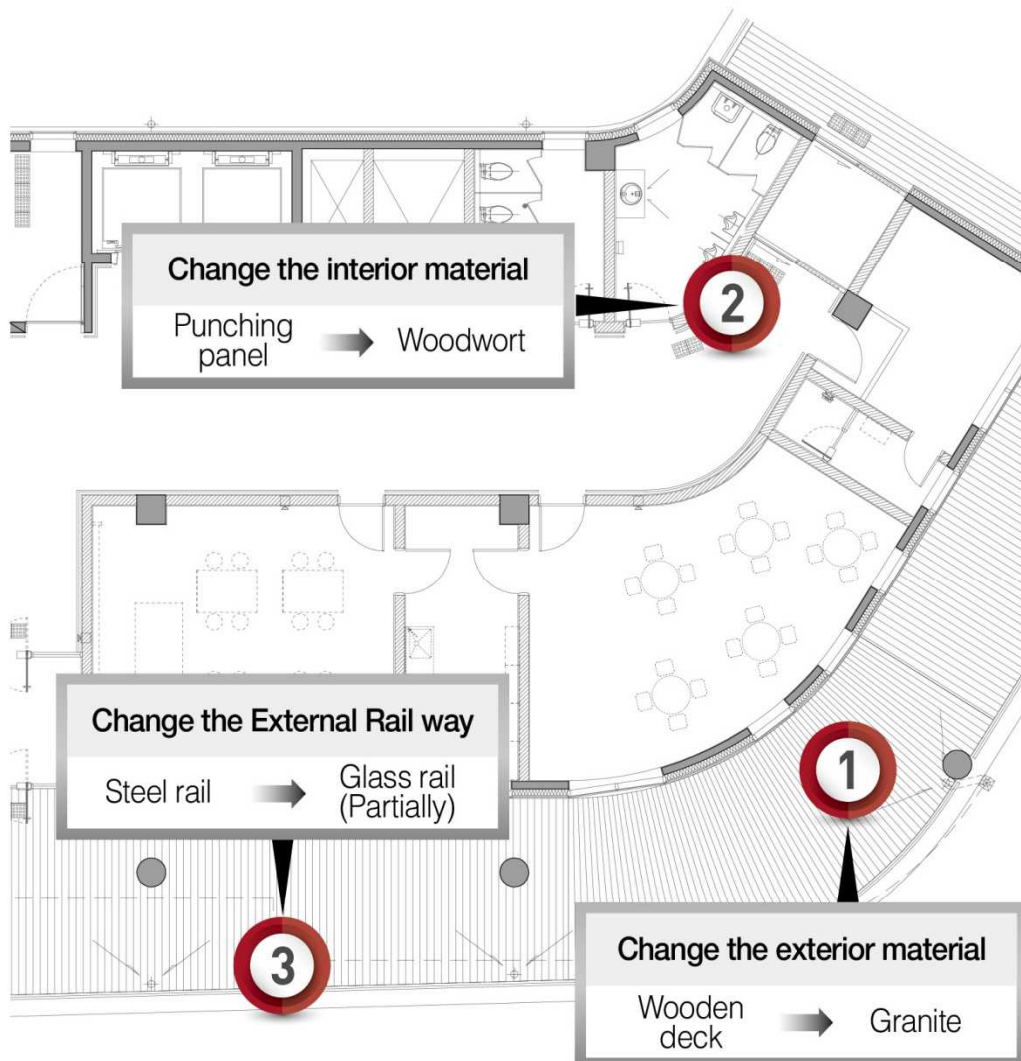


Improved the maintenance when install the site glass

“**188.9%** value-enhancement”

3.3 Design Management - Design Change

■ Design change record management using PNS



3.3 Design Management - Design & Colors

▣ Design Motif

Points : Water, trees, water droplets



Lines : Mountain ridges, ground



Surface : Land



“Apply friendly and comfortable design development from the nature motif”

3.3 Design Management - Colors

■ Color direction (Outside)



“ Apply the urban color, high brightness and low chroma, to harmony with surrounding the environment ”



“ Select the nature materials and colors to link with natural material and color express ”

3.3 Design Management - Colors

Color direction (Inside)



blue zone



red zone



green zone



purple zone



orange zone

Floor 1



Floor 2



Floor 3



Floor 4



Floor 5



“Setup the functional color for each floors”

“Rhythmic and vibrant colors”

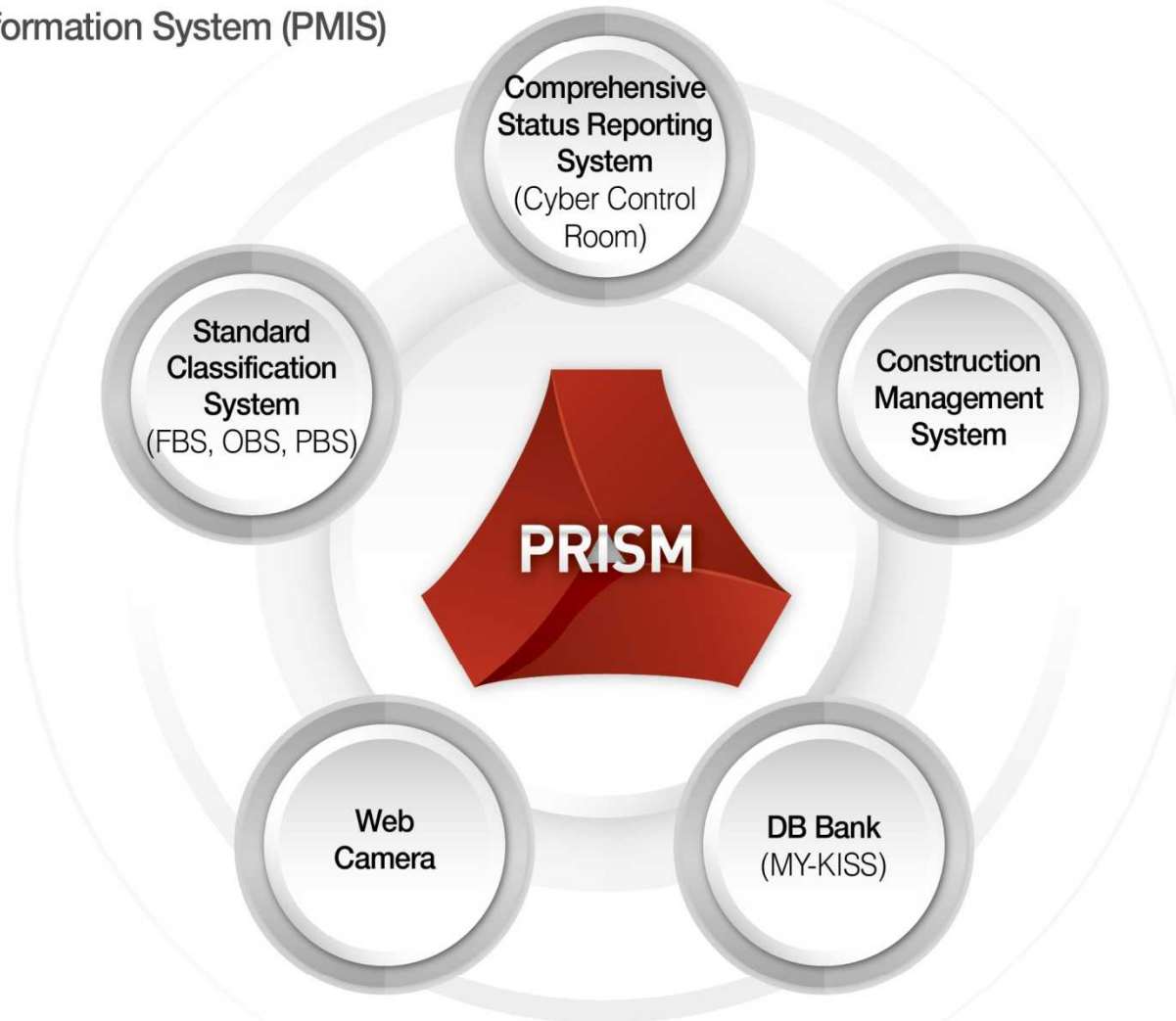
3.4 Site Management - PMIS



“Perform the Systematic Construction Management System base on the Web CM foundation”

3.4 Site Management - PMIS

▣ Project Management Information System (PMIS)



“Progress management applied the PLC and the whole construction management”

“Establishment of technical information DB and systematic data management”

“Information sharing with project participants”

3.4 Site Management - PMIS

- Web camera apply into the site management

Web Camera based Monitoring System



Multi Camera



Detail Viewer



Camera Control



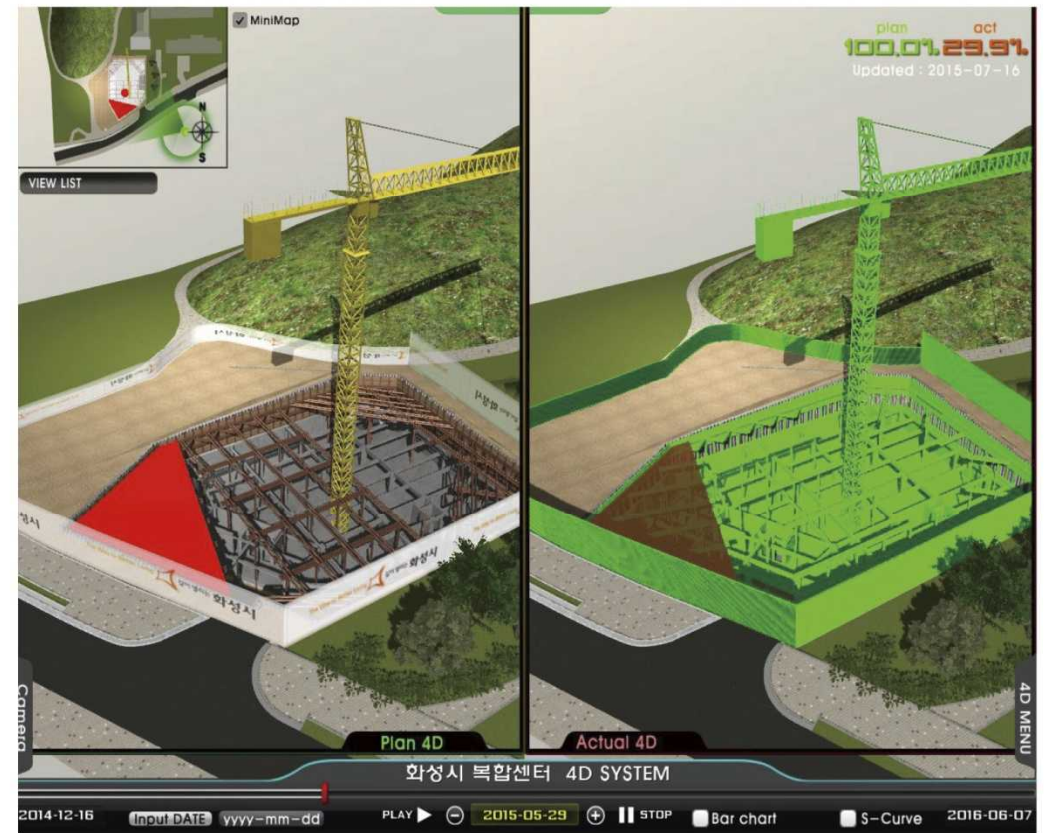
3.4 Site Management - PMIS

- 3D (4D) simulation apply into the progress management

Progress schedule & S-Curve



Check the lack of performance(Plan vs Result)



* Create the progress data based on CMP work

3.4 Site Management - PMIS

3D (4D) simulation apply into the progress management



VIEW LIST

- 1. SE Perspective
- 2. SW Perspective
- 3. NW Perspective
- 4. NE Perspective
- 5. Perspective #1
- 6. Perspective #2

4D MENU

- Web Camera
- Still Shot
- Worker View
- Drive View
- Original View Point

화성시 복합센터 4D SYSTEM

2014-12-16 Inout DATE yyyy-mm-dd

PLAY 2016-06-07 STOP

Bar chart

S-Curve 2016-06-07

- ✓ Select Object
- ✓ Simulation Speed
- ✓ Activity Bar View
- ✓ Object Information
- ✓ Progress Rate View

Activity Schedule bar View



VIEW LIST

- 1. SE Perspective
- 2. SW Perspective
- 3. NW Perspective
- 4. NE Perspective
- 5. Perspective #1
- 6. Perspective #2

4D MENU

화성시 복합센터 4D SYSTEM

2014-12-16 Inout DATE yyyy-mm-dd

PLAY 2015-09-04 STOP

Bar chart

S-Curve 2016-06-07

Date and the position of the time bar and the object date can be adjusted



4D display date

Current date

2011-01-22

2011-03-16

PLAY Plan 4D Simulation

- ✓ Schedule Data Import
- ✓ Adjustment / Confirmation Data Export
- ✓ Plan date - Play button
- ✓ Actual date - Play button
- ✓ Position information based on XY coordinates
- ✓ Selection of the View Point and Mini Viewer

3D simulation progress management into the process data

3.4 Site Management - Construction Management

▣ Technical support to the Genecon

“Grade 5 Constructor Capacity”

Lack of
construction
expert

Lack of
administration
capacity

Lack of
safety
awareness

“Project-tailored for the CM Technology support”



Technical Guide



Administration Support



Safety Guide

3.4 Site Management - Construction Management

▣ Daily meeting

Review the Manpower Execution



Review Equipment Execution



Review Construction Method



“Leading daily meetings”

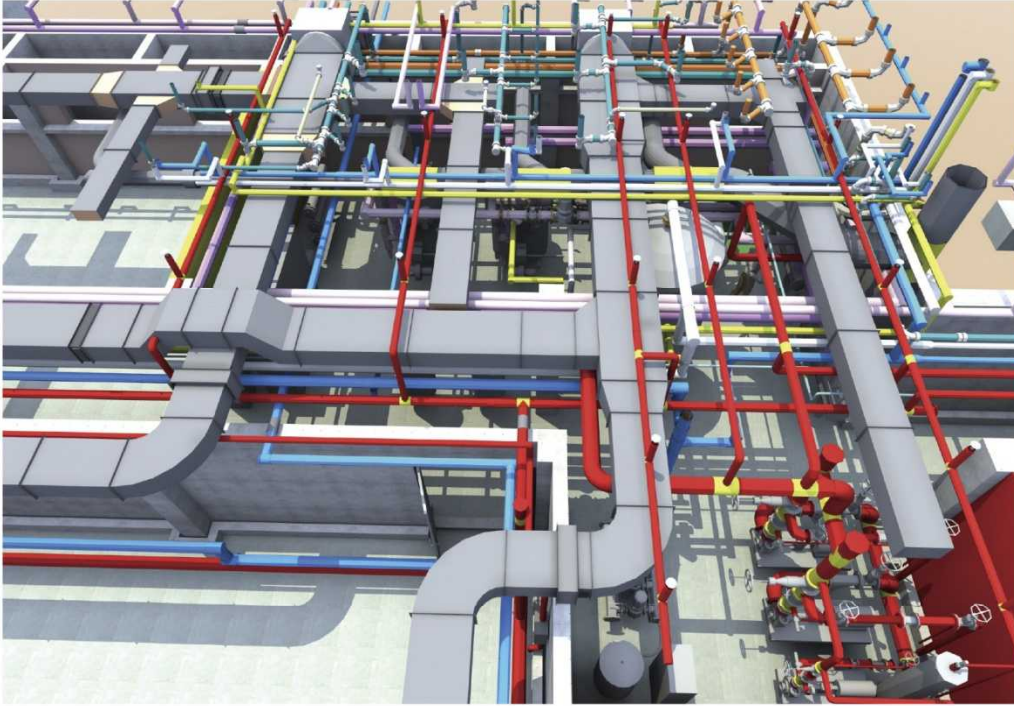
Find out the site problems in the beginning/early stage



Daily basis progress management

3.4 Site Management - Quality Management

3D Modeling



Secure the design quality

Determine the quantity/volume data



Review the Energy efficiency review

Review the constructor performance

Prevent the reconstruction work base on pre-interface review

3.4 Site Management - Quality Management

- ▣ Mock-up test for each field

Curtain wall wind test



Curtain wall waterproofing test

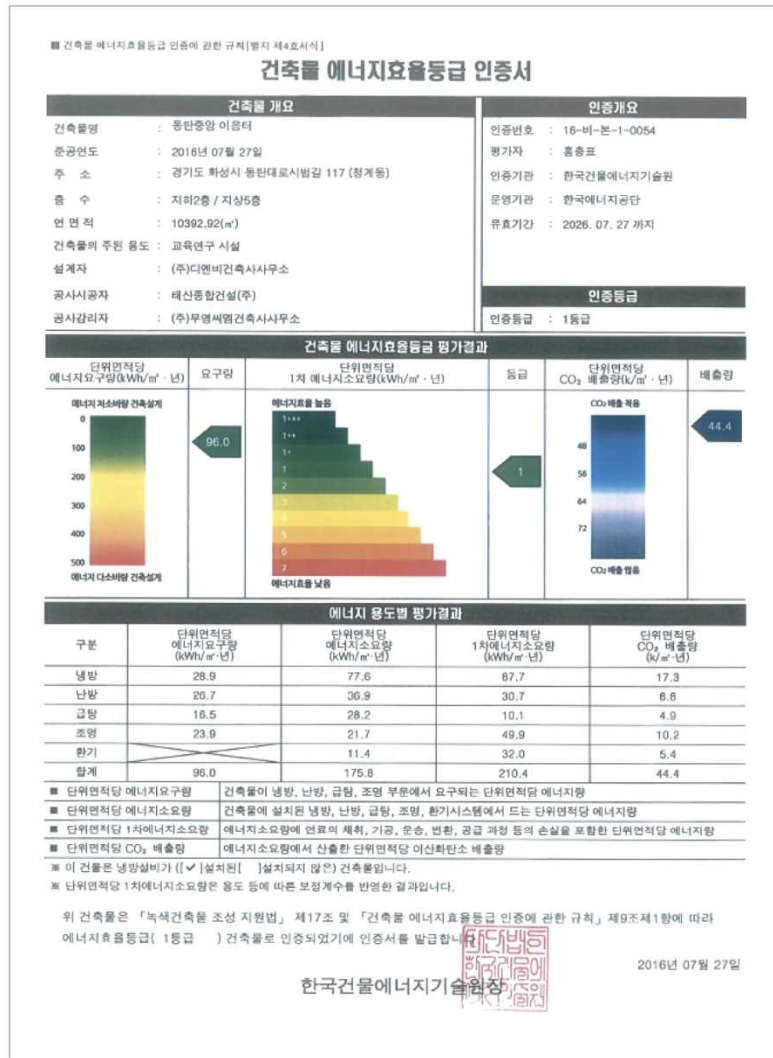


Securing quality through various types of tests such as curtain wall mock-up

3.4 Site Management - Quality Management

Eco-friendly Certification

Building Energy Efficiency Level Certificate (Grade 1)



Eco-friendly Green Building (Green grade 4)



3.4 Site Management - Main Risk Responses

▣ Hedge the narrow construction land

Difficult to install the Earth Anchor and Strut because of the narrow land



**Apply e-phc pile method and then reduce 1 month construction time
and secure the workspace early**

3.4 Site Management - Main Risk Responses

Environment Management

Noise and Dust can be disrupt the school lesson and occur the resident civil calim



Real-time noise measurement



Installation of wheel cleaning facility



Sprinkler operation



Setup the temporary soundproof wall and situation board to manage the real-time noise and dust

3.4 Site Management - Apply the New Technology Methods

■ NSV Splitting method



- Use the Splitting equipment instead of explosion method (Manage the noise level below 10dB)
- Non- vibrating - noiseless method
- Working capacity / team : 450 ~ 550m³ / day

**Improve of construction performance and reduce the 2 months construction time,
prevent the adjacent facility damage**

Part 4

Site Management

4.1 Partnership

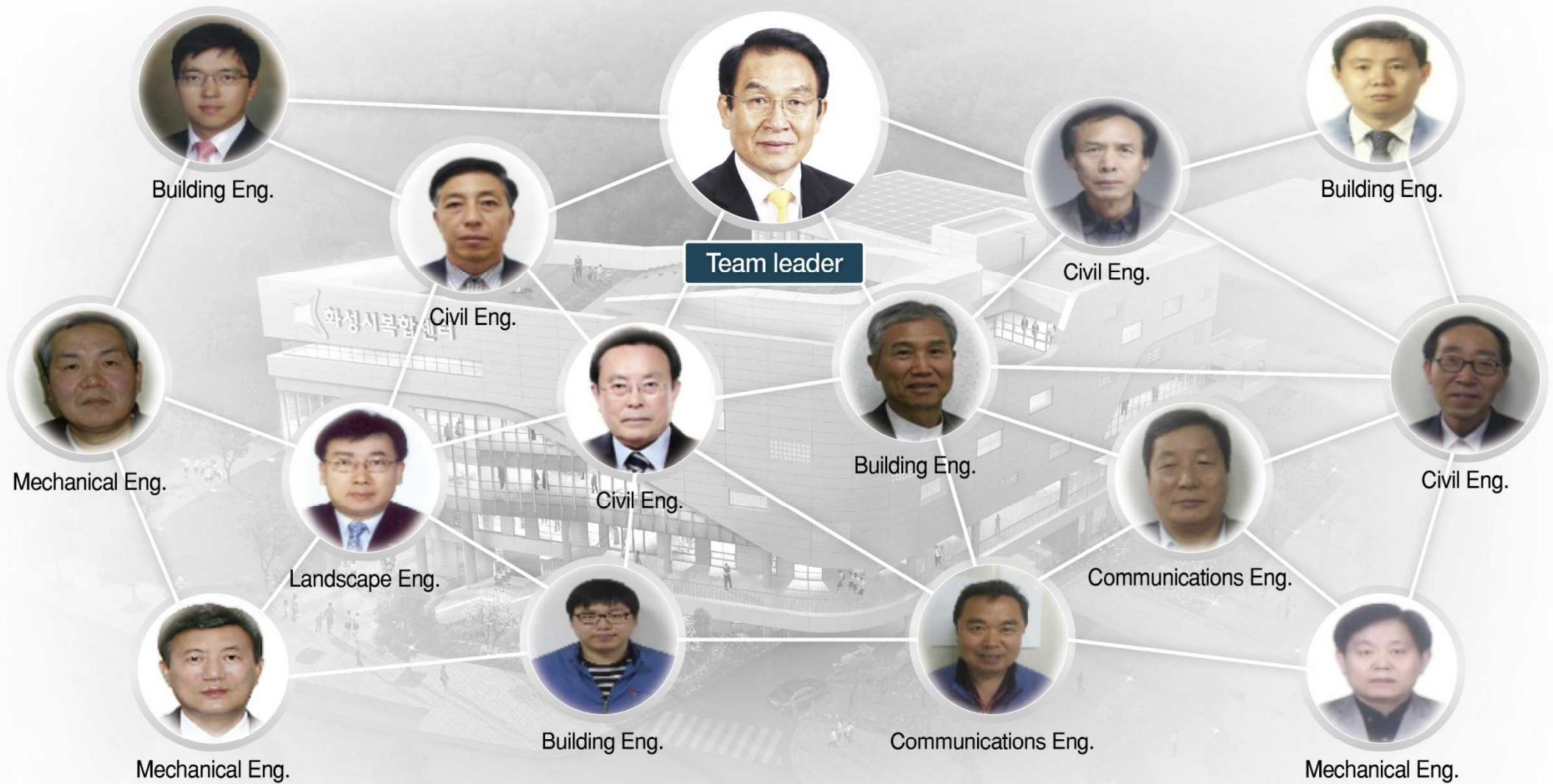
4.2 Teamwork

4.3 Hand over

4.1 Partnership

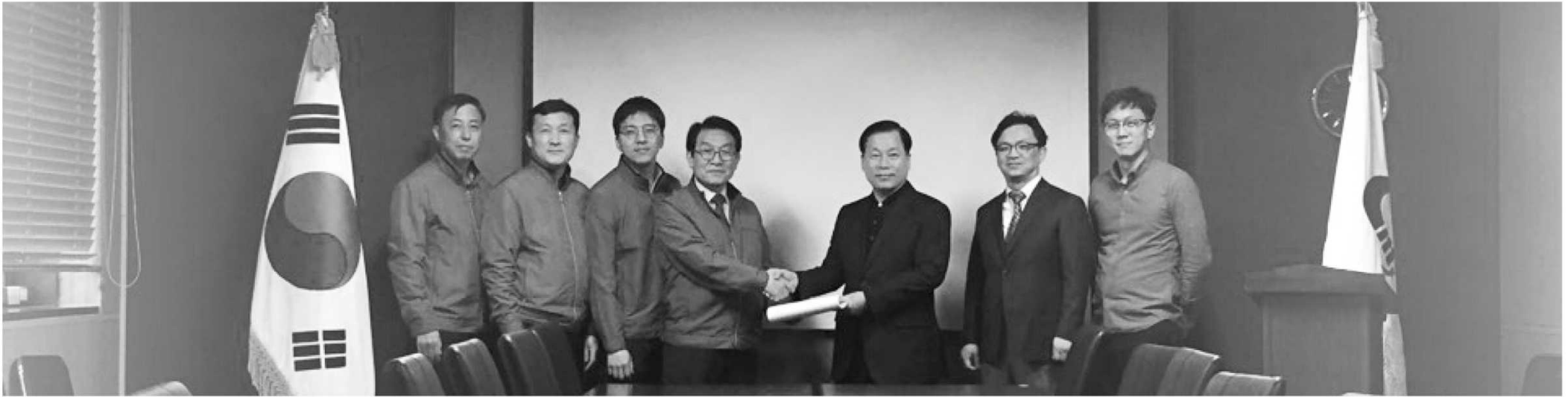


4.2 Teamwork



“All members of team become one CM team”

4.3 Hand over



Operator training and technical support



Document and data transfer



Achievement award from Hwaseong City Mayor



Completion of a successful project handover !



Thank You