



Integrated Project Management service for Incheon International Airport Phase 3

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1. Project Summary

- Project Summary
- Project Background
- Organization



Project Summary (Phase 3)

Incheon International Airport 2nd Passenger Terminal,
T2 Transportation facilities (KTX, Incheon Airport Railroad), Apron,
Extension of Airport by Stage

Item	Description	
Total	Gross floor area 1,150,000m ²	
2 nd Passenger Terminal	Gross floor area 384,000m ²	B2-5F
2 nd Transportation Center	Gross floor area 139,000m ²	B2-4F
Annex Building	2 nd Control Tower, etc.	
Air Side	Apron 56, IAT/BHS Tunnel etc.	
Land Side	Access Transportation – T2 Access road 22km etc.	

Project Summary

2nd Passenger Terminal



T2 Front Facility



T2 Entrance Road



Baggage Handling System



Site Clearance



Incheon International Airport Phase II



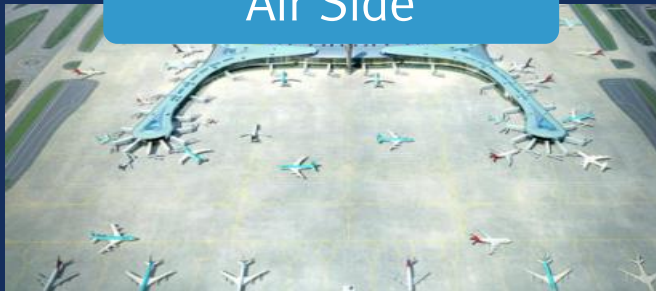
Incheon International Airport Transportation Center



Annex



Air Side



Land Side



Bird's Eye View

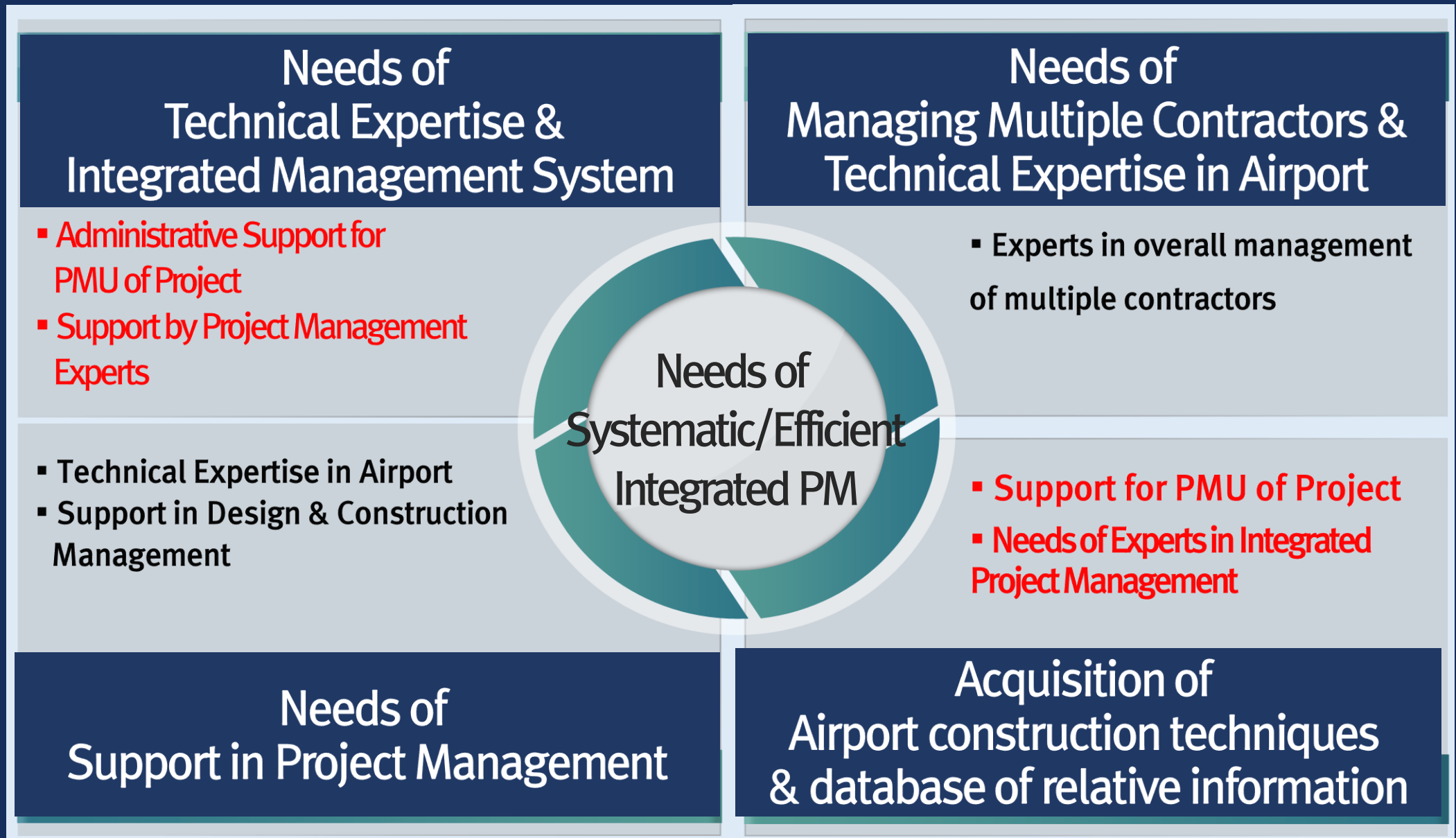
Incheon Airport (Phase 3)



Bird's Eye View (Phase 4)



Introduction Background of Integrated Project Management Service



Project Summary

- ❖ Project Name : Integrated Project Management Service for Incheon International Airport 3rd Phase
- ❖ Contract Period : 'Dec. 14, 2011 ~ 'Dec. 31, 2017 (72Months)
- ❖ Partners

Domestic : i-PMIS(Idea Information Technology Co., Ltd.), Green Building(HNC)

Overseas : IAT (LOGPLAN), BHS(BNP Associates, Inc.), Architectural Structure (Arup Group),
Environmental Design (Wilмотte & Associates), Navigational Aid (ACS International LLC)

❖ Participation by phase

Sort	Stage					
	Planning	Design	Procurement	Construction	Commissioning	O & M
Client						
Integrated Project Management (incl. Design Management)						
CS Team						

Scope of Service

Integrated Project Management

- Project Planning
- Schedule Management / Material Management
- Safety/Quality/Environment Control
- Project Management Information System (i-PMIS)

Design Supervision / Construction Management / Commissioning Test Control

- Design Supervision
- Design Management
- Technical Support in On-site issues
- Commissioning Test Control

Technical Support regarding Airport Construction

- Technical Support by Experts of 6 airport-related special sectors
- Technology Transfer & Training

Systematic and Specialized Technical Support based on Effective Cooperation System

Integrated Project Management System

Integrated Project Management

- Project Planning, Schedule Management, Cost Management
- Integrated Information Management regarding Safety, Quality & Environment
- Project Progress Analysis, Service Scope Review & Technical Review
- Integrated Project Management Service

Integrated Project Management for Phase 3

Design Supervision/Construction Management

- Underground Structures, 2nd Passenger Terminal
- Design Supervision of Architectural and Civil Engineering Structures incl. Front Elevated Bridge, etc.
- Design Supervision of Mechanical, Electrical, Firefighting, Telecommunication Facilities
- Design Supervision of Power Facilities

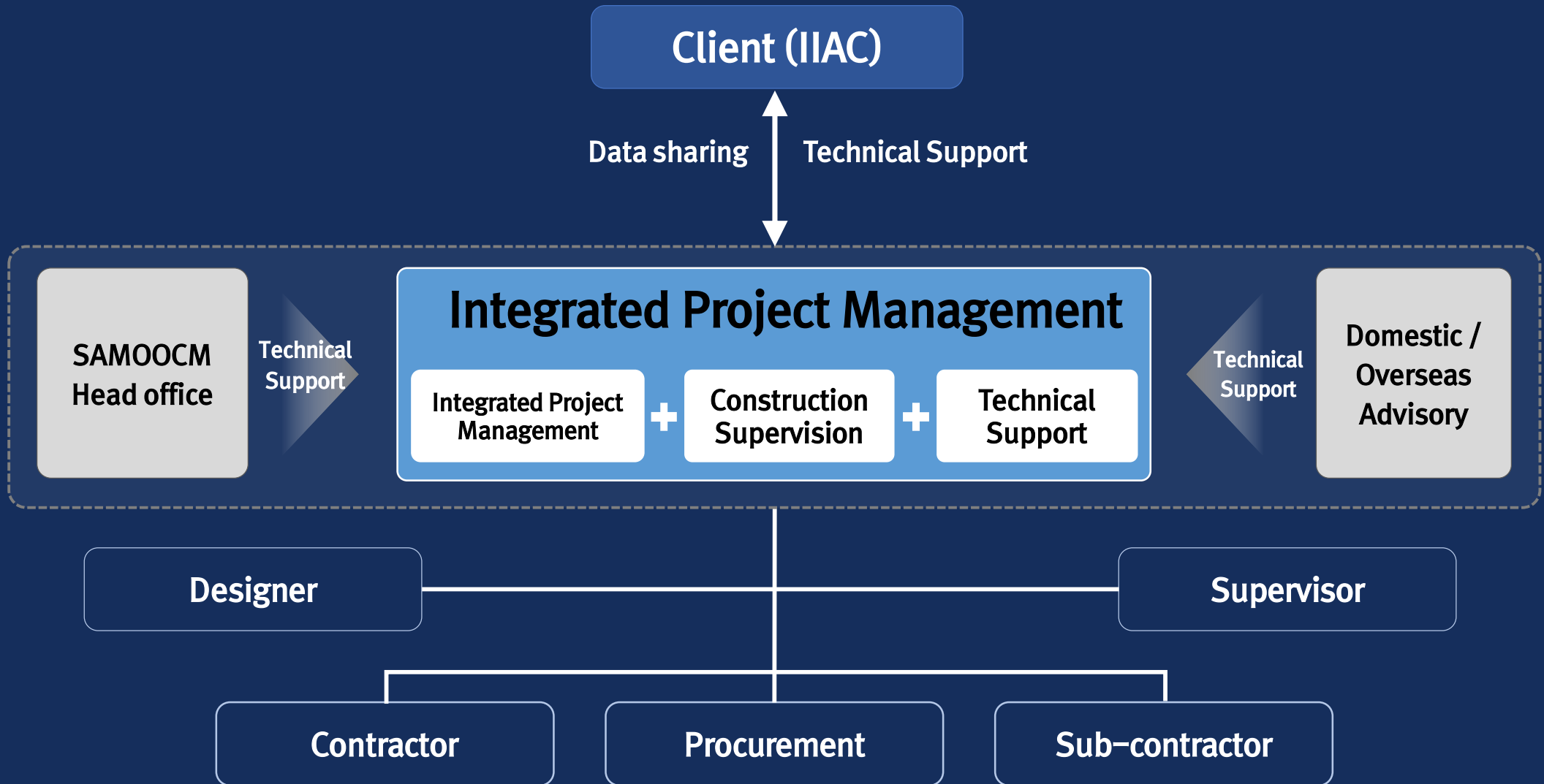
Design Supervision of Airport Facilities based on relevant laws & regulations

Airport-specialized Technology

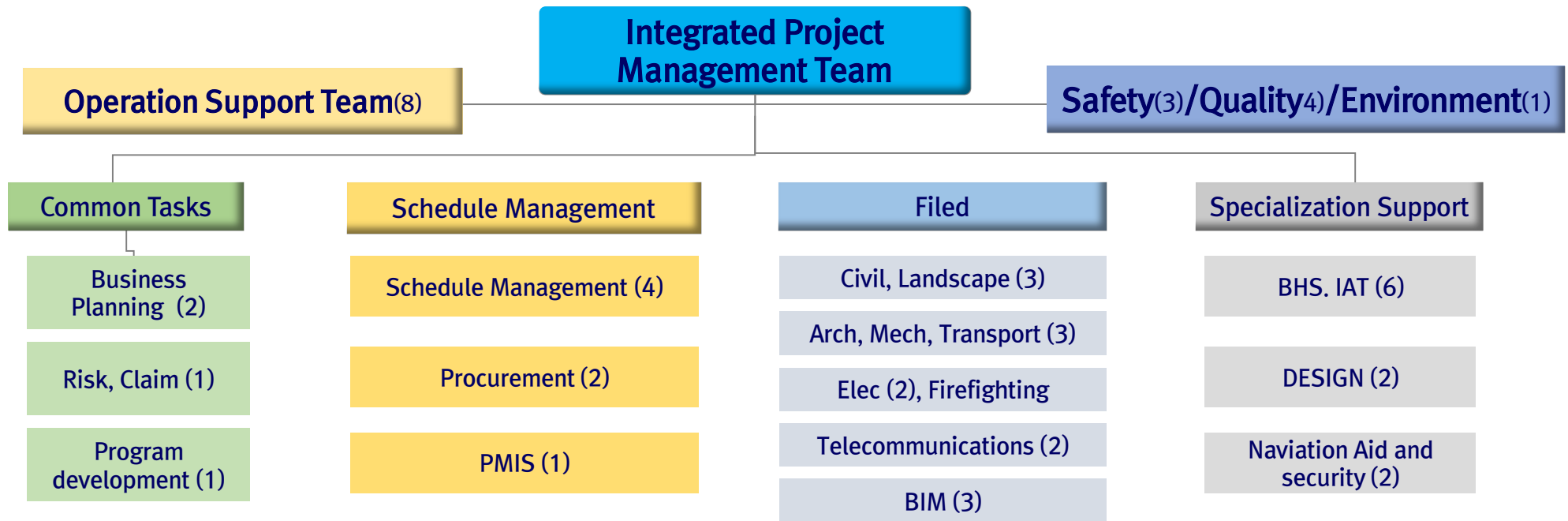
- Technical Support in 6 areas of Expertise
 - Architectural Structure, Environmental/Interior Design, Green Building Technology, BHS, IAT, Navigational Aid

Design Deliverables, Technical Review & Alternative Proposal, Interface Management

Project Management Organization Chart



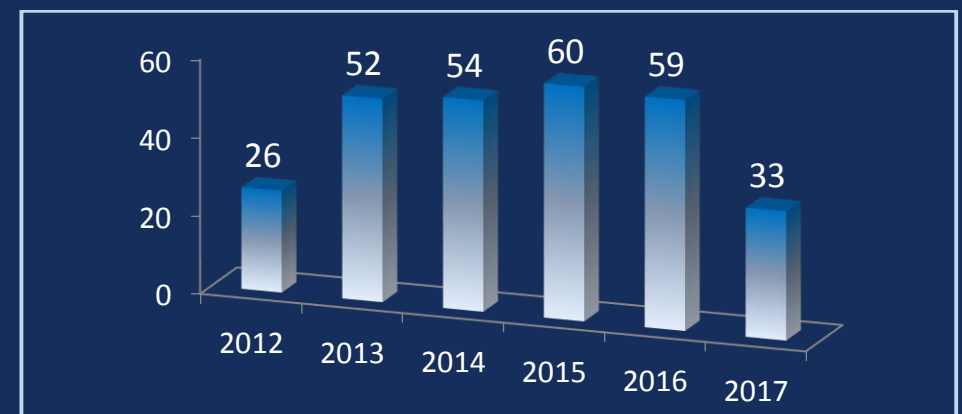
Organization



◇ Expert Input

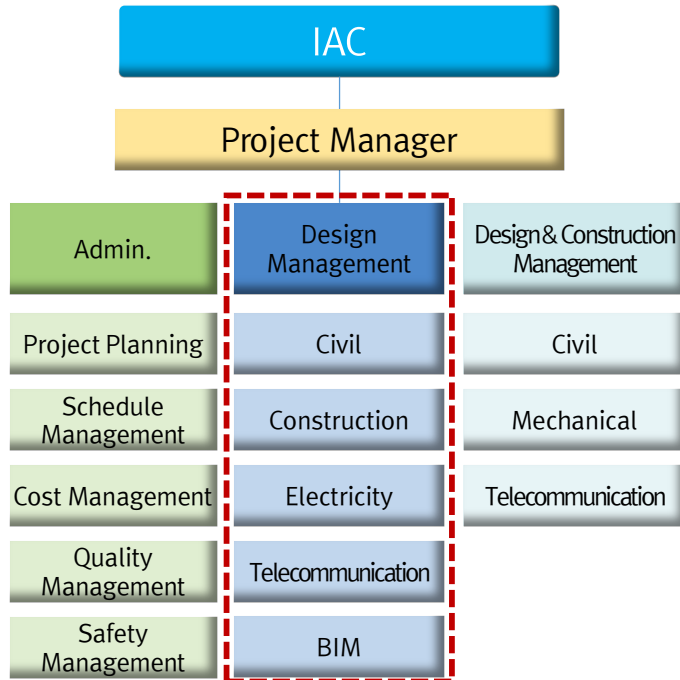
Qualification	Number of People
Licensed Architect	4
Professional Engineer	4
Construction Management Professional of Korea	5
Engineer Architecture	45

◇ Input of technician



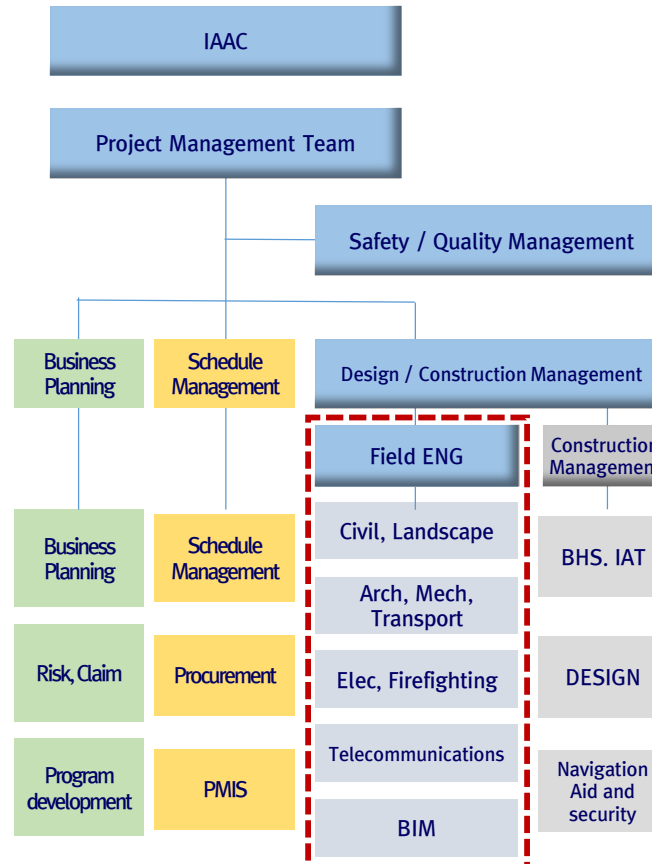
Organization

◇ Stage 1 : Design Management



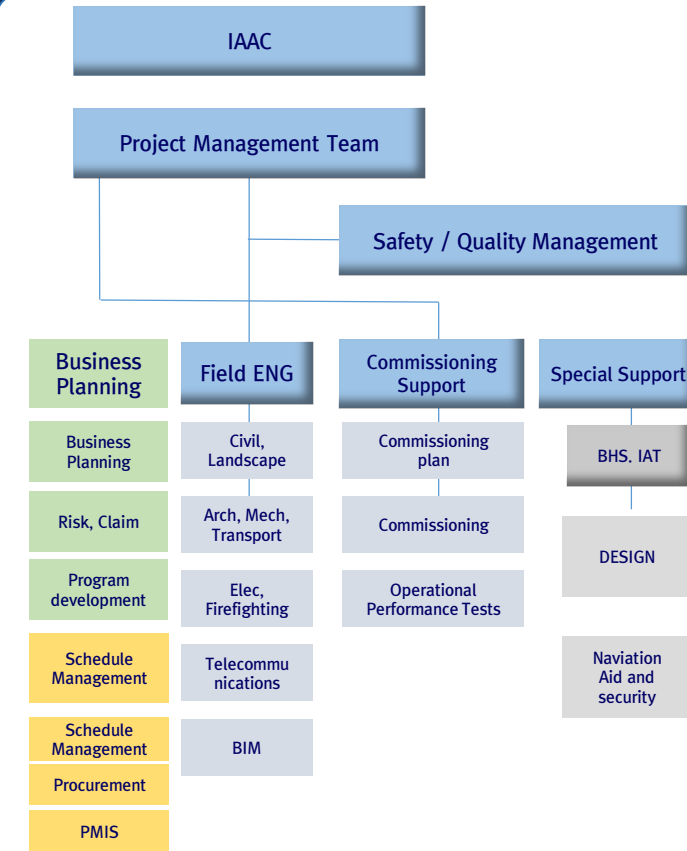
- Allocation of Engineers participated in Incheon International Airport Phase 1, Phase 2
- Formation of Design Supervision Team and operation thereof
- partnership with overseas airport-specialized companies

◇ Stage 2 : Construction Management



- Ensuring the work efficiency by allocation of Engineers participated in design stage
- Technical Support in on-site issues
- Reinforcement of interface management for construction by BIM Team

◇ Stage 3 : Commissioning



- Allocation of Engineers participated in design and construction stages at the higher priority
- Assignment of major roles to Engineers participated in commissioning test during Phase 1 and 2.
- Formation of integrated team with Client's staff in charge of commissioning test

2. Key Performance

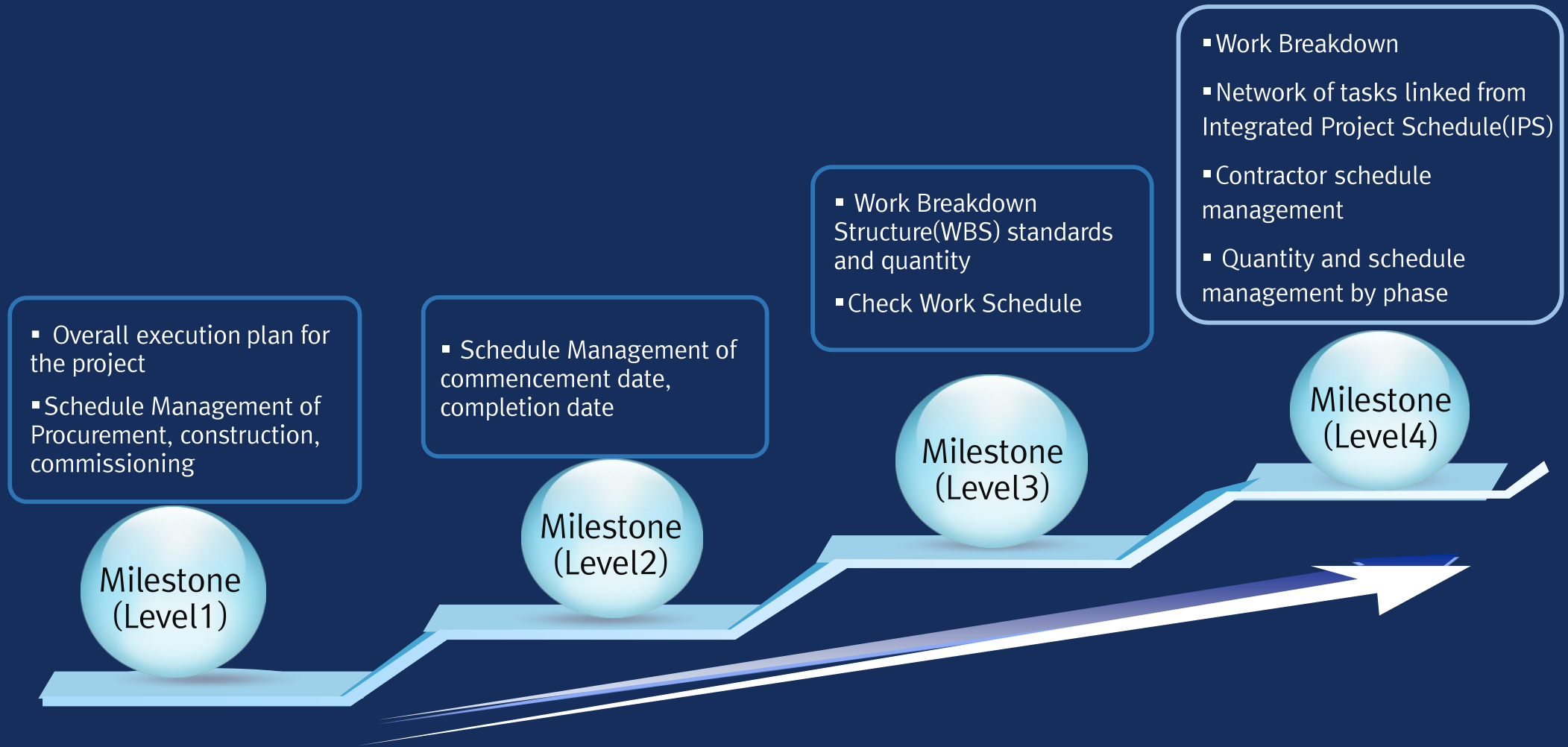
- Case Study of Project Management



Objectives of Service

Progress Management	Enabling the successful completion of the project on Time
Safety, Quality, Environment Control	Enabling ZERO serious accident in Construction Site
Quality Control	Enabling High-quality and No-defection
Environment Control	Enabling CLEAN Construction site
Design & Construction Management	Integrated CM for successful completion
BIM	Integrated Interface Management using BIM
Technical Expertise in Airport Special Sectors	Consulting service for technical issues in Airport special sectors
Administrative Support for Operational procedures	Improvement of Standard Construction Manual

Integrated Project Schedule Management



Provides schedule management guidelines,
and manage major targets of schedule

Project Management Information System

Establishment of Project Management Information System (PMIS) for Systematic Management of Phase 3, Information Sharing, and Timely Decision-making

▪ Function of Project Management Information

Function	Description
Administrative works	▪ Project number system management, Code Request / Approval Management
Corrective Measure	▪ Interface management, To-Do-List, Meeting minutes, Meeting schedule control
Project Cost Management	▪ Total project cost management, contract status, management of implementation plan and track record, cost estimation
Progress Management	▪ Management standard (IPS), contract schedule management, construction progress management, cost management by work
Construction Management	▪ Project summary, Staff input management, subcontract management, progress management, material management
Safety/Quality/Environment Control	▪ Quality inspection, Quality record book, quality test control ▪ Safety check, Check on fulfillment of assignments related to environment issues, environmental effects evaluation
Notice / Bulletin Board	▪ Notice, Bulletin Board, Download, Q&A

Establishment of Project Management Information System (PMIS) for Systematic Management with consideration for compatibility with newly relevant system, information exchange, and use convenience

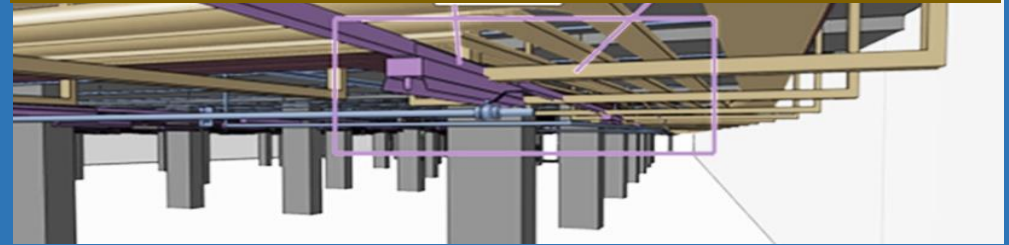
Management of Design Deliverables

PMIS



Check-on of design progress and Real-time schedule adjustment

3D / BIM



Review of Interface between works and design errors through 3D Modeling

Design Checklist



Management of design progress and details based on design checklist

Airport Project Database



Establishment of design database based on case analysis of Phase 1, Phase 2, and other Airport Projects

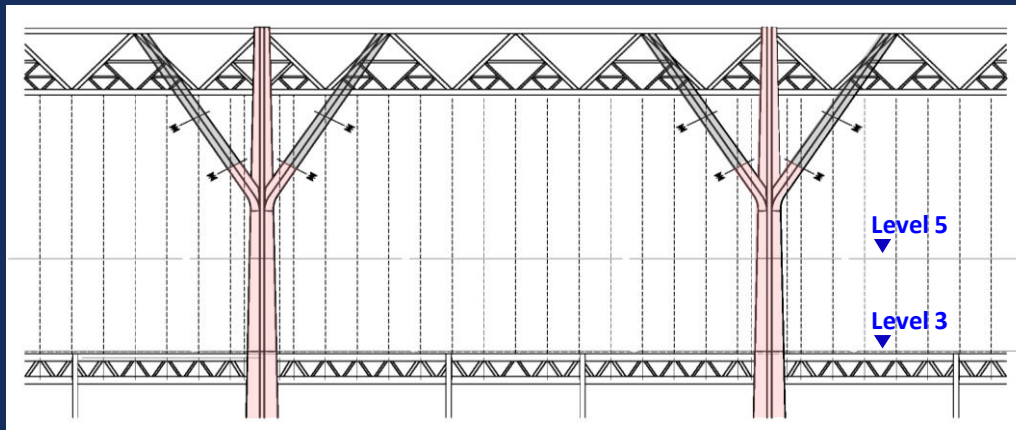
Optimizing design quality through reviewing the appropriation and connectivity to existing facilities, grasping problems of drawings, suggesting solutions thereof.

Design Safety Review

Ex) Review Result of safety and constructability of design

Opinion

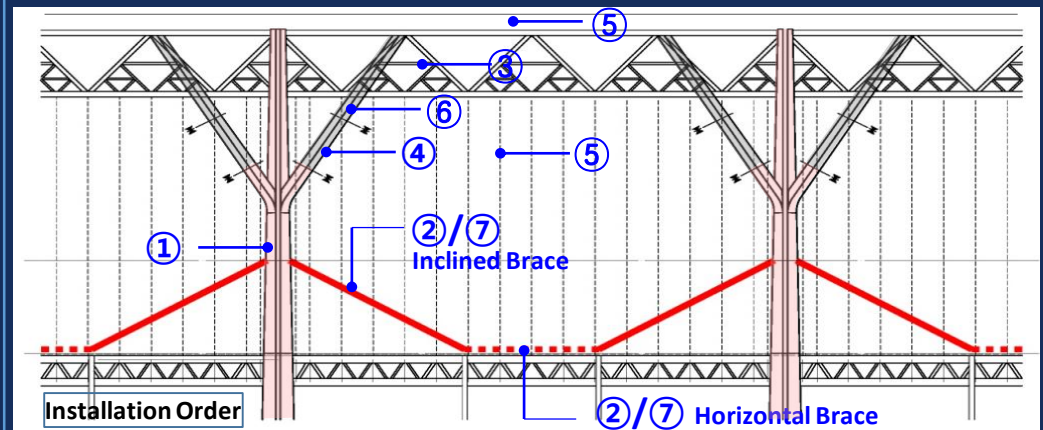
- Need to establish a plan for structural reinforcement against horizontal load (wind, seismic load) during construction



- Need to remark on how to and when install installing temporary brace on the drawing of Frame Elevation

Measure taken

- Installation of additional inclined and horizontal braces onto Tree Col.
- Remark on the installation order of Tree Col. (Arup agreed)



① Installation of Tree Col. → ② Installation of Temporary brace → ③ Installation of Roof frame (Truss Install) → ④ Temporary coupling of branch → ⑤ Roof finishing /Cable tension → ⑥ Coupling of branch → ⑦ Temporary Brace Removal → Installation Completion

Result

- Ensuring structural safety by reinforcing structure against horizontal load expected to occur in installation
- Enabling easy installation by remarking on the installation order of Tree Col.

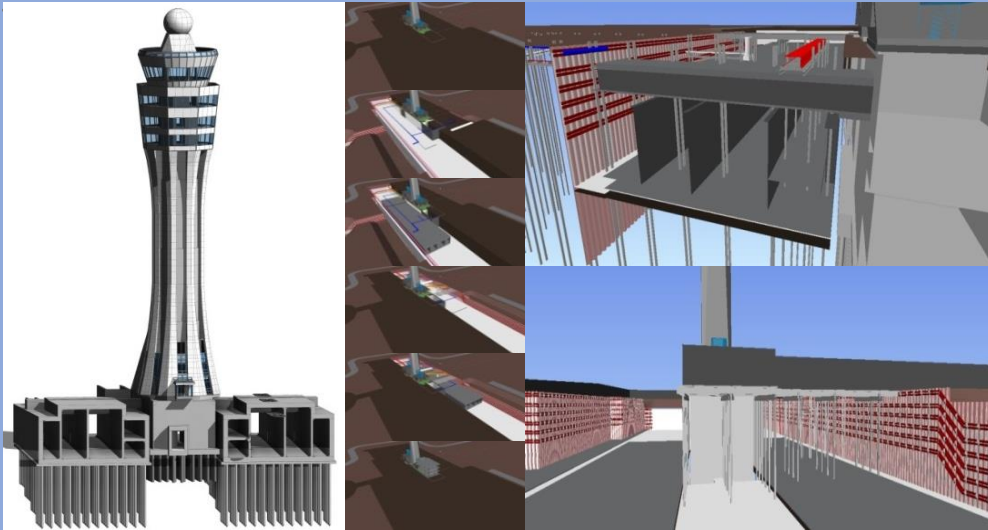
Technical Review of design deliverables to check whether:
the design satisfies legal requirements and design standards; suitable construction method is selected;
the design enables easy installation and easy maintenance; and the like.

Building Information Modeling

Design & Construction Interface Management

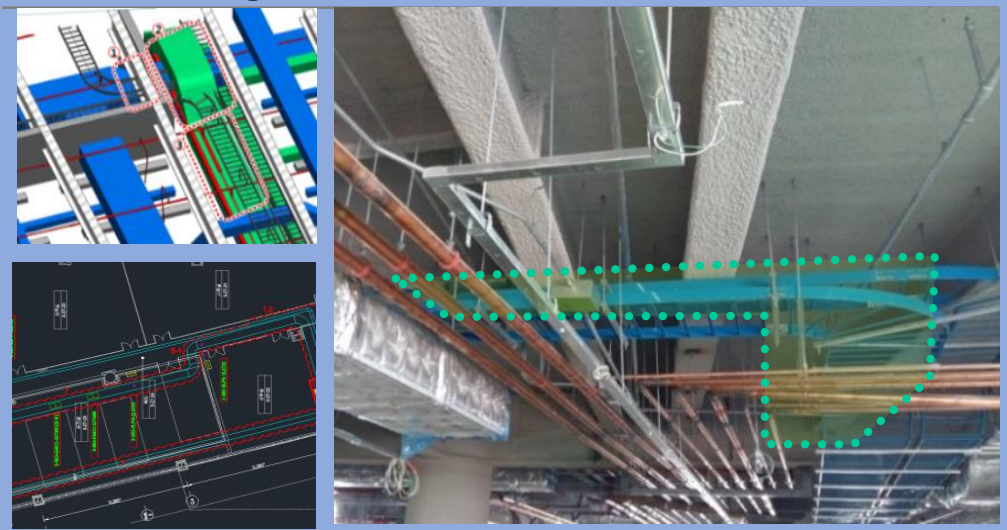
Construction Interface Management

- Detection of possible interference items in advance
- Solutions for possible interference
- Increase in consistency of drawings



Process Interface Management

- Check on process interface based on the order of installation
- Reducing construction period and cost by minimizing interference



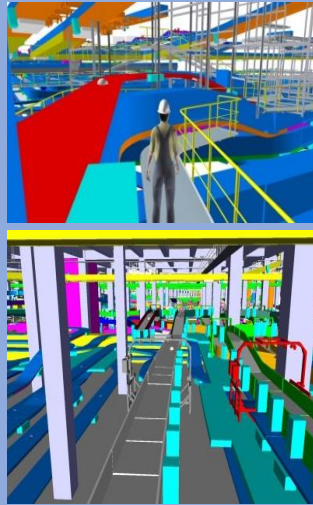
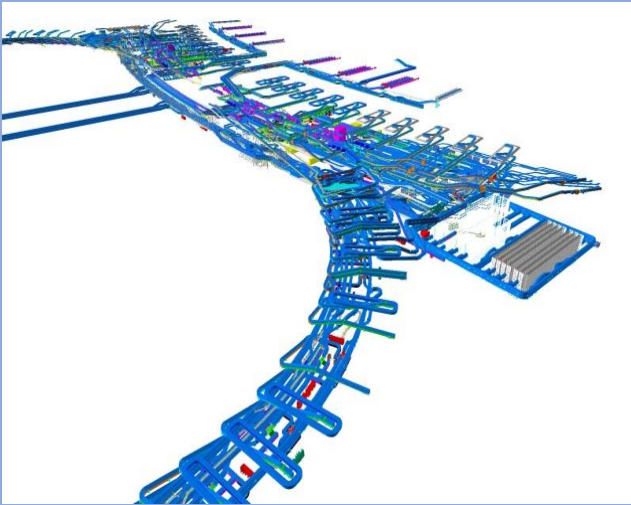
**Solutions to interference in items due to construction schedule,
Interface management of interference predictable items
& Support in timely design change thereof**

Building Information Modeling

Technical Review of Design Deliverables

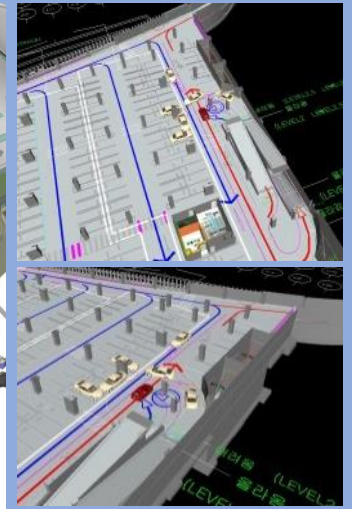
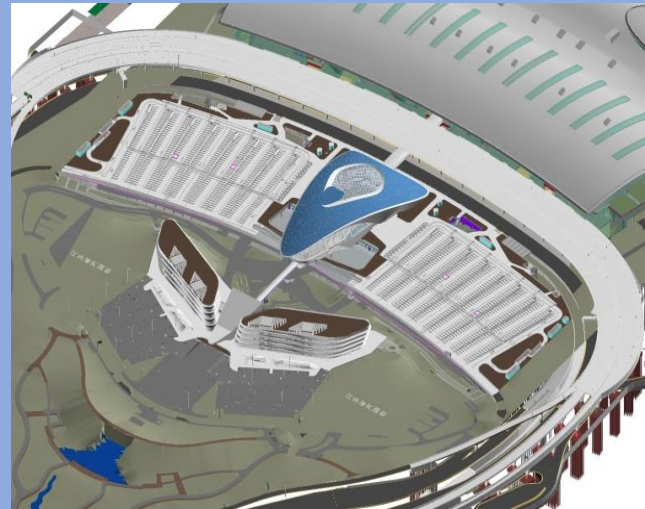
Enhancement of the understanding of design document

- Shortening time required for decision making of Project participants
- Shortening construction preparation period
- Minimizing errors caused by lack of understanding of drawings



Operation and Promotion

- Establishment of new management plan due to change in Site by phase and execution thereof
- Utilization of BIM documents for briefing visitors to construction site
- Enhancement of the efficiency of operation after construction completion



Quality Review based on BIM by stage, Intensive management of key issues,
Technical review (Discrepancies between requirements and design documents)

Building Information Modeling

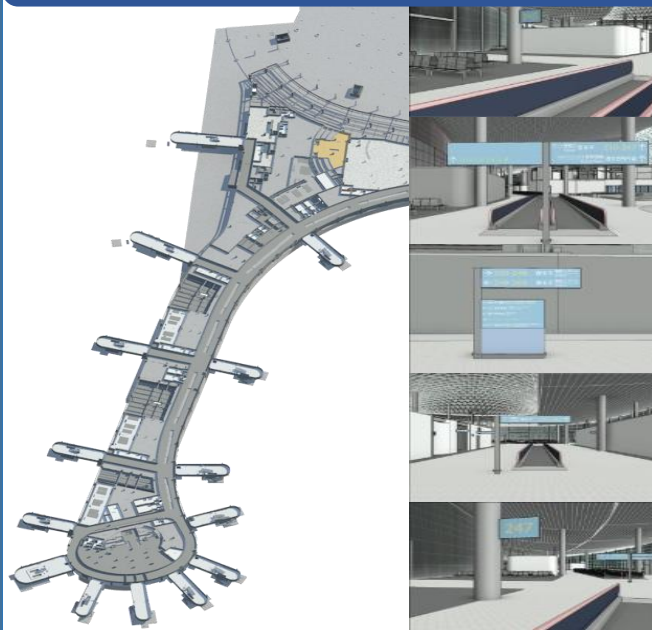
Simulation-based Technical Review

Landscape Simulation



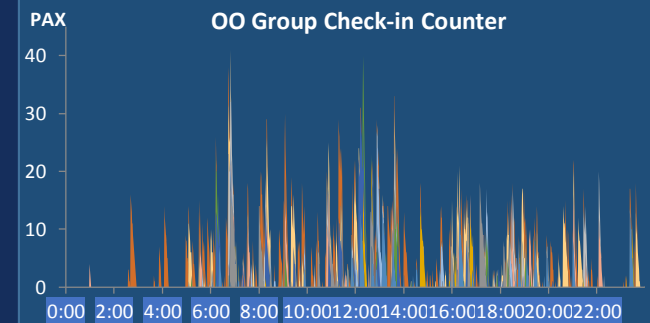
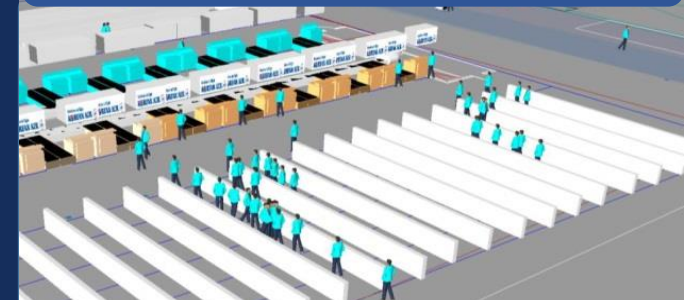
Review of Layout of
Major Facilities and Interface

Passenger Traffic Simulation



Review of Signage for
44 Major Traffic Lines

Passenger Handling Simulation

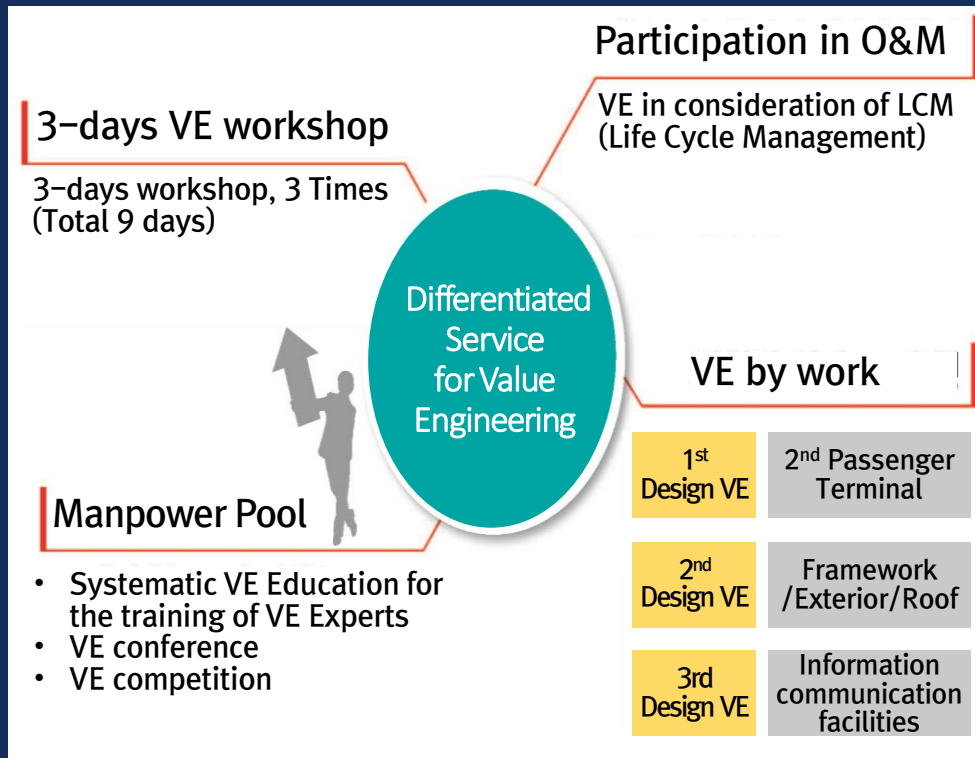


Verification of Passenger Flow
System & Floor plan for
Passenger Handling Facilities

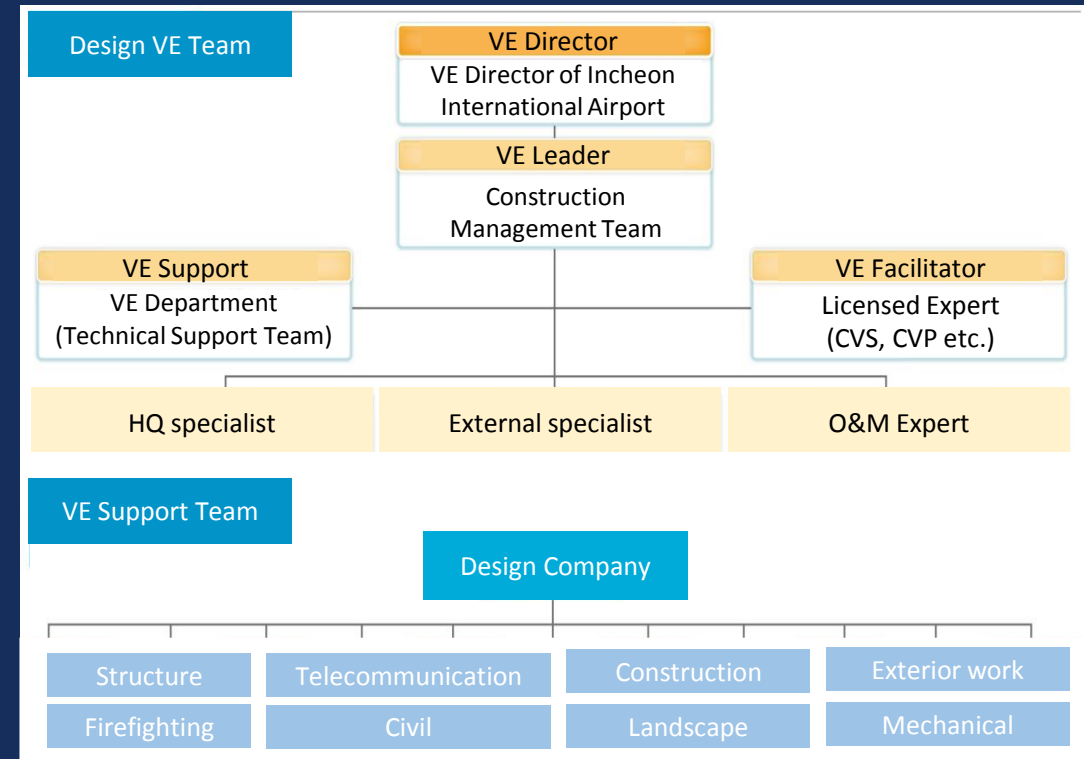
Intensive Management for satisfying Performance Criteria
through Simulation-based review of major functions by stage

Design Value Engineering (VE)

Keynote for Design VE



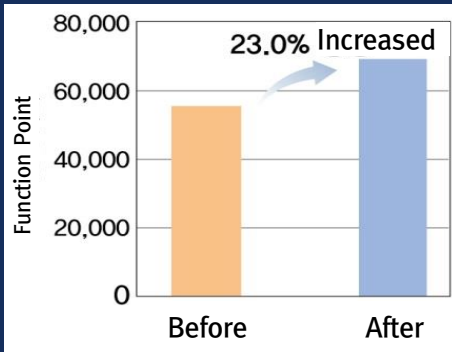
Design VE Team



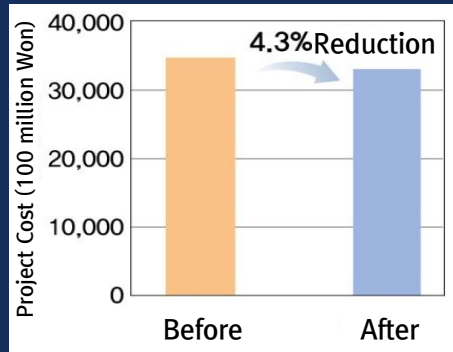
- Increase in the value of the building by increasing functions and beauty of the building, ensuring structural safety and quality, and reducing cost
- Reduction on the project cost by review of the selected items and installation method for the same.

Design Value Engineering (VE)

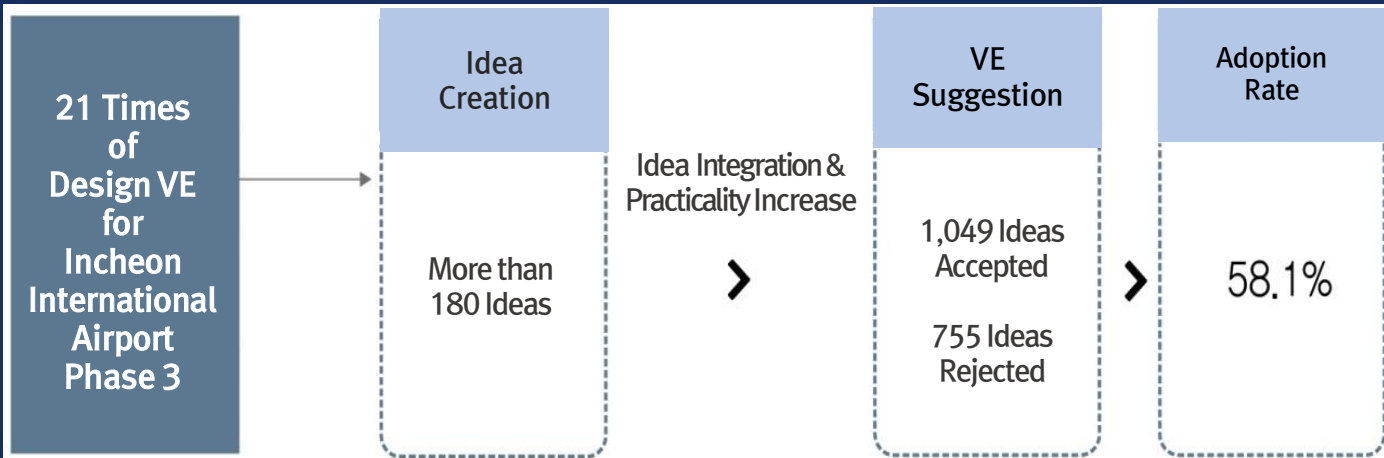
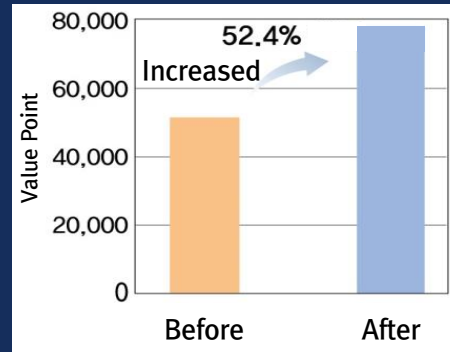
Function Increase



Cost Reduction



Value Increase



Participated in
2013' National VE competition
(Ministry of Land, Infrastructure and Transport)

21 Times of VE / Ensuring value competitiveness through differential activities / Publication of Design VE casebook

Risk & Claim Management

Overall Risk Management

- Classification system by stage
- Analysis on predictable risk and causes thereof
- Checklist (133 Items)

Intensive Risk Management

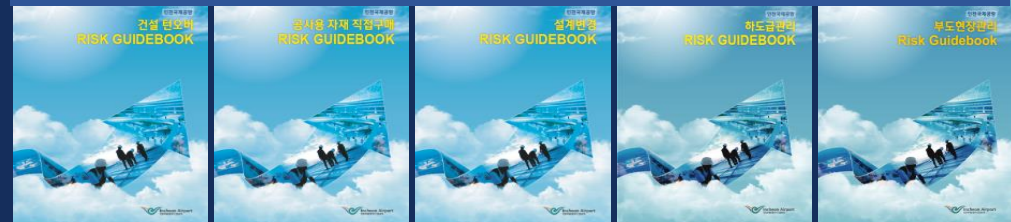
- Item selection for intensive risk management
- Break down of Management level such incl. management procedure and guideline by item, etc.
- Improvement of Checklist by field / work

Levelling of Risk Management Items

(Overall Risk Management → Intensive Risk Management)

Items	Description
Bankruptcy	Work guide to prevent delays and quality decrease in case of bankruptcy of contractor
Subcontract	Work guide to prevent low-cost subcontract and overdue payment
Design Change	Work guide for design change including design change standard, cautions, etc.
Materials	Work guide for timely procurement of materials, quality control, and material turnover
Turnover	Work guide for timely taking over of construction site between contractors

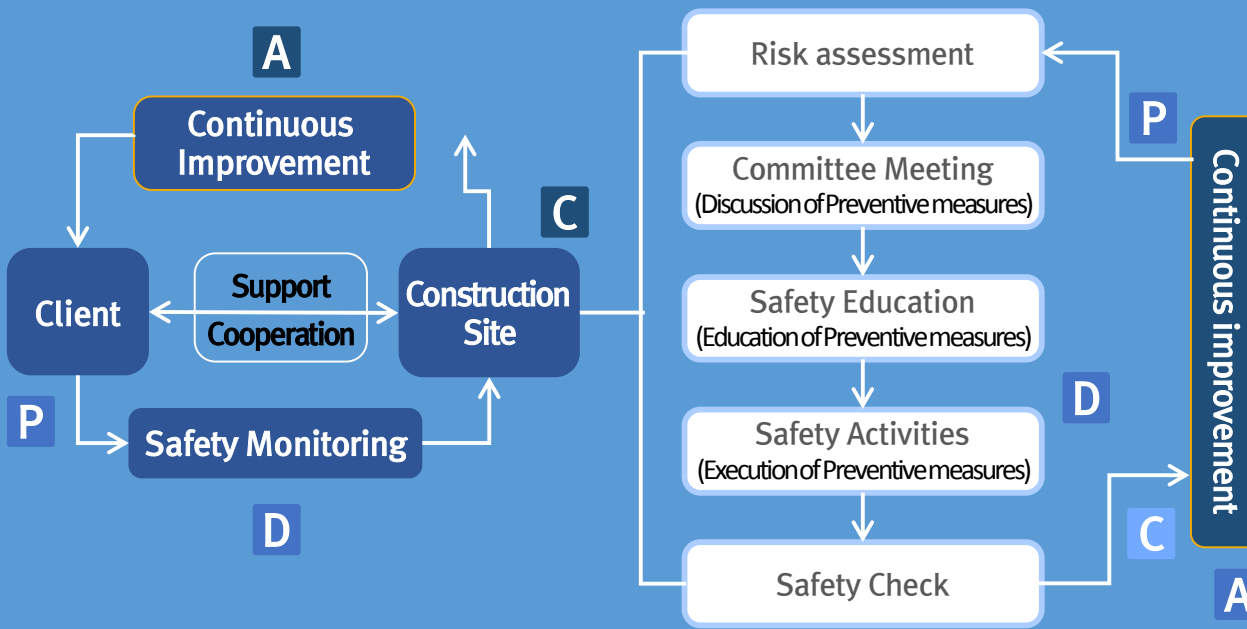
Publication of Risk Management Guide Book



Intensively managing items selected after prior detection of risk factors for Phase 3 through case studies of existing airports facilities (Phase 1 & 2)

On-site Safety Control Activities

Occupational Health and Safety Assessment Series (KOSHA 18001)



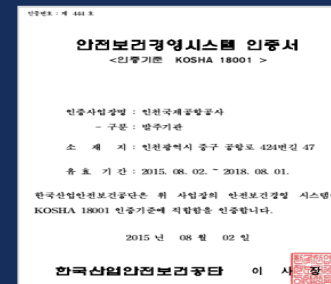
Safety & Quality Control Committee

Discuss safety & quality managing method before commencement of construction



High-place-work Approval System

"Safety First"
Need to get an approval before high place work



Maintain and Improve the certificate of Occupational Health and Safety Assessment Series (KOSHA 18001)

Risk assessment by work and formation of committee

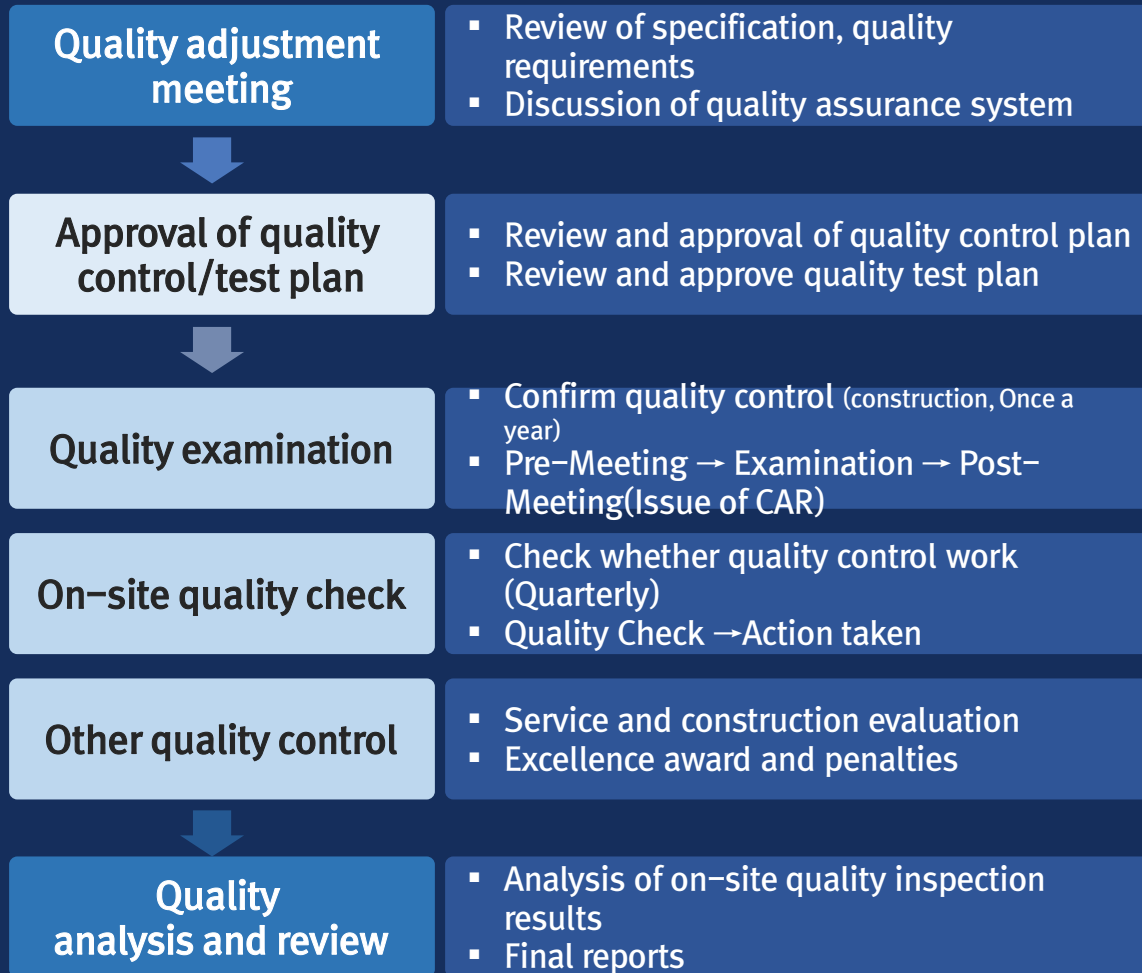
On-site Safety control by field and Safety & Quality test (Approx. 100 times)
Construction Safety Experience Training (Approx. 700 times / 25,000 persons)

Enabling successful completion of Phase 3 by On-site Safety Control

Reduction on Construction disaster → Quality Improvement → Successful completion of Phase 3

Construction Quality Control

Construction Quality Control System



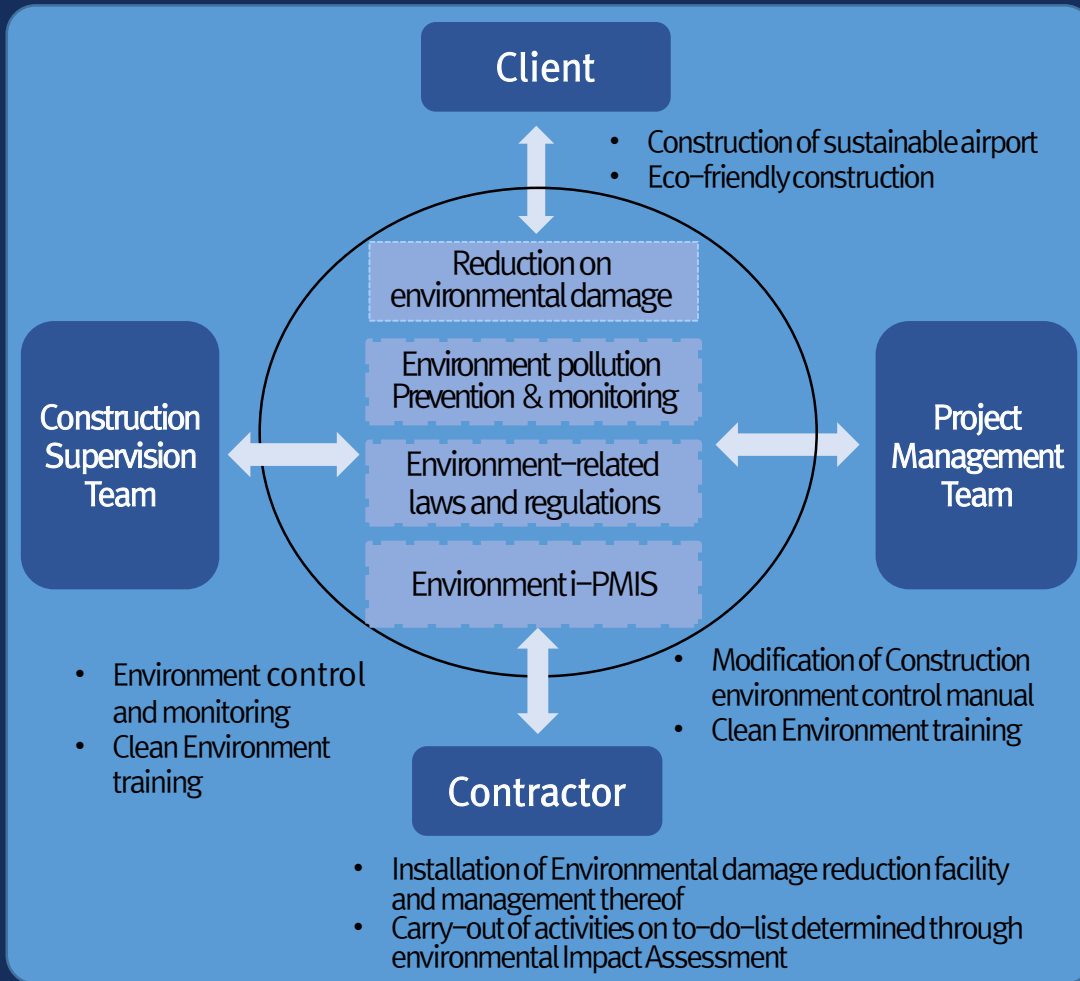
Major Quality Control Activities

- Revision of quality management manual and quality management procedure
- Conduct quality adjustment meeting
- Company evaluation
- Implement preventive quality training
(Quality control training, External specialist training before work)
- Field-oriented quality inspection activity
(Shared result of quality inspection, sharing major quality control items)
- Obtain opinions from contractors through quality manager meetings

Construction Quality Management System (ISO 9001) improvement and operation

On-site Environment Control activities

On-site Environment Control System



Major quality control activities

- Regular quality monitoring and guide, intensive quality check by work
- Periodic report of analysis result of quality monitoring and guide activities
- Pre-notice system for monitoring seasonal items on site
- Clean-Up day
- Waste real name system
- Customized training
- On-site environment monitoring
(Regular, periodic, special, unexpected, thematic)



Publication of
Environment Control
White Book

Minimizing environment effects to adjacent areas, ensuring safe operation of aircraft, and motivating engineers to participate in environment control activities by environment monitoring the overall construction site.

Technical Support

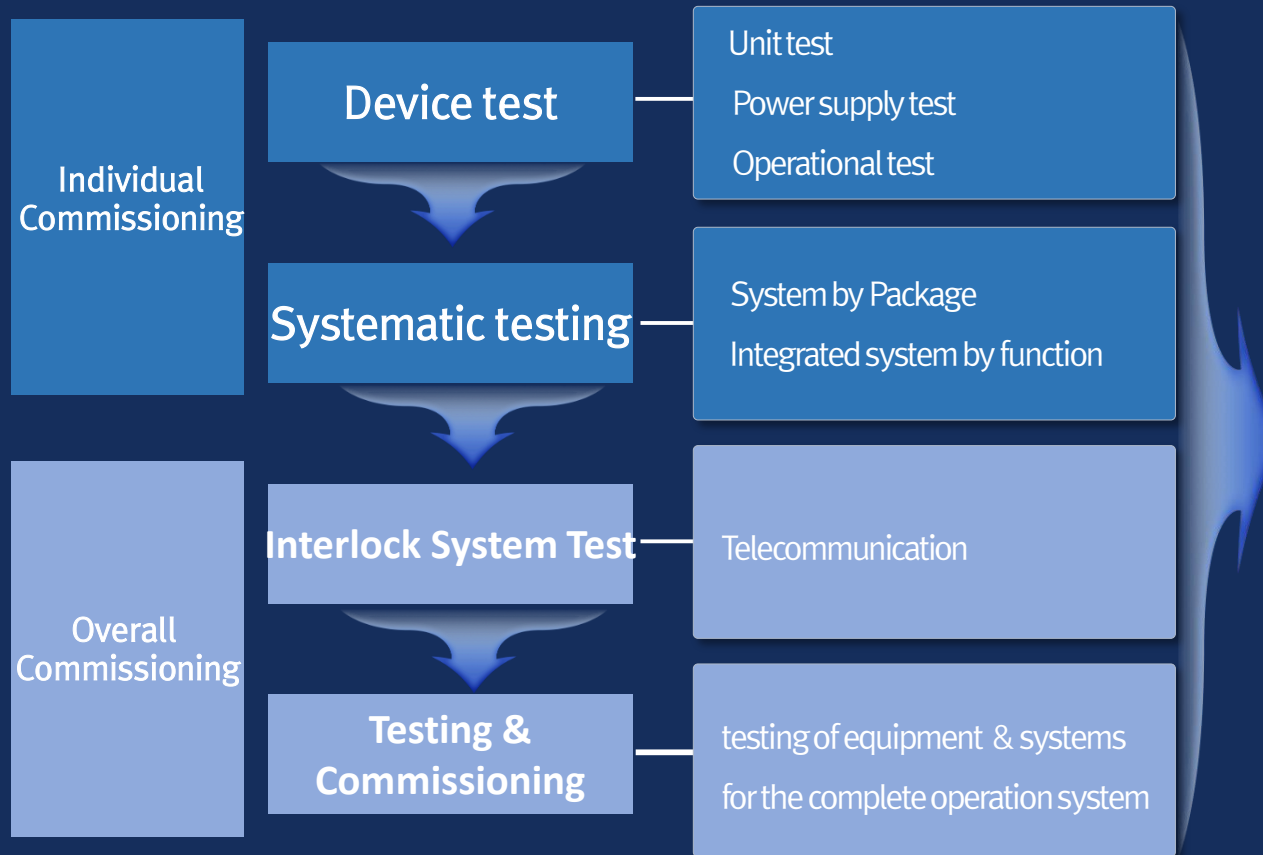
Technical Support airport-related special sectors

Sort	Major Items
Architectural Structure (Overseas)	Review of Roof Structure, Seismic design criteria, and façade structure
Environment/Interior (Overseas)	Consultation (10 times), Review of Basic Design Concept (Large-span space, Check Island, Signage, Furniture Design)
Green Building Technology	Green Building Certification, Renewable Energy, LEED Certification, Solar Light System, Insulation Performance Control
BHS (Overseas)	Analysis on malfunctions of Loading system, Review of Baggage claim and power-turn system, Review of Future extension plan, Support in test and commissioning
IAT (Overseas)	Review of IAT running surface, Vehicle stop-off area, Vehicle communication system, and future extension plan
Navigation Aid (Overseas)	Preparation of configuration diagram of air traffic communication system, and network analysis diagram, air traffic communication system diagram, and Block diagram of Airfield lighting & Instrument Landing system

Technical Support for achievement of Project objectives & improvement of Airport functions through technical expertise specialized in Airport

Support in Commissioning

Commissioning Management



Work Support

- Review and adjust individual commissioning plans, procedures
- Training Support for O&M
- Revise O&M procedure
- Operation Manuals
- Preparation of system operational test scenario and manual
- Monitor system-integrated unit test and manage the result thereof

Integrated technical support in commissioning stage to enable timely completion of construction, successful opening, and efficient service after opening

Training / Education

Training Scope

- Training in Schedule Management
- Training in quality control and quality audit
- User Training in construction project management system (i-PMIS)
- User training in bid amount appropriateness examination system
- Training in Safety Management
- Training in Environmental Management
- Training in BIM Technology
- Training in Commissioning

Training Result

Number of Training : 934 times

Number of People : 33,230 people

Implementation Status by Year

Year	Field	No. of times	No. of person
2013	8 Fields	41	366
2014	8 Fields	199	4,920
2015	8 Fields	387	12,739
2016	6 Fields	307	15,205
Total	11 Fields	934 times	33,230 persons

Strengthening participants' capacity and transferring Know-how of Project Management and relative methodologies by training the construction participants and client's staff for enterprise by field.

Simplify administrative procedures

Quality Management Manual

Quality management procedure

Construction management procedure

Contract management procedure

Outsourcing procedure

Design Management Procedure

Data Management Procedure

Process control procedure

Business Number System Procedure

Guideline

- Concrete Construction Guideline
- Facilities Maintenance Guideline

Reference

- Design Integration Standard
- Airport Design Standards (Volume 8)
- Process / cost integration standard.

Other regulations

- Airport professional specifications

Achievement

Activities performed

Sort	Major Activities Performed
Common Work	▪ Amendment of Airport Construction Procedures and Guidelines ▪ Claim analysis and response to dispute ▪ Preparation of Management Milestone for Phase 3 and revision thereof ▪ Management of Room-Turnover and Procedures of Commissioning Test ▪ Estimation of Total Project Cost and Management thereof ▪ Check on the status of construction activities, Quality Control, and Material Quality Inspection ▪ Establishment of safety, quality and environment management plan and training
Design (Supervision) Management	▪ Management of the interface between contractors ▪ Design change management and Design VE ▪ Management of Design interface using BIM, Design Review
Construction Management	▪ Administrative Support in Contract of Construction Supervision Service ▪ Planning of supportive facilities for construction and execution thereof ▪ Management of the interface between constructors and Solution suggestion
Commissioning Test Control	▪ Establishment of Comprehensive commissioning plan ▪ Testing and Commissioning of Installations

3. Gallery



Gallery



Incheon International Airport Phase III
(2nd Passenger Terminal)

Air. Land Side

Gallery



Fixed Boarding Bridge and 2nd Apron Control Tower

Air Side

Gallery



Incheon International Airport Passenger Terminal 2

Air Side

Gallery



Control Tower, 2nd Apron

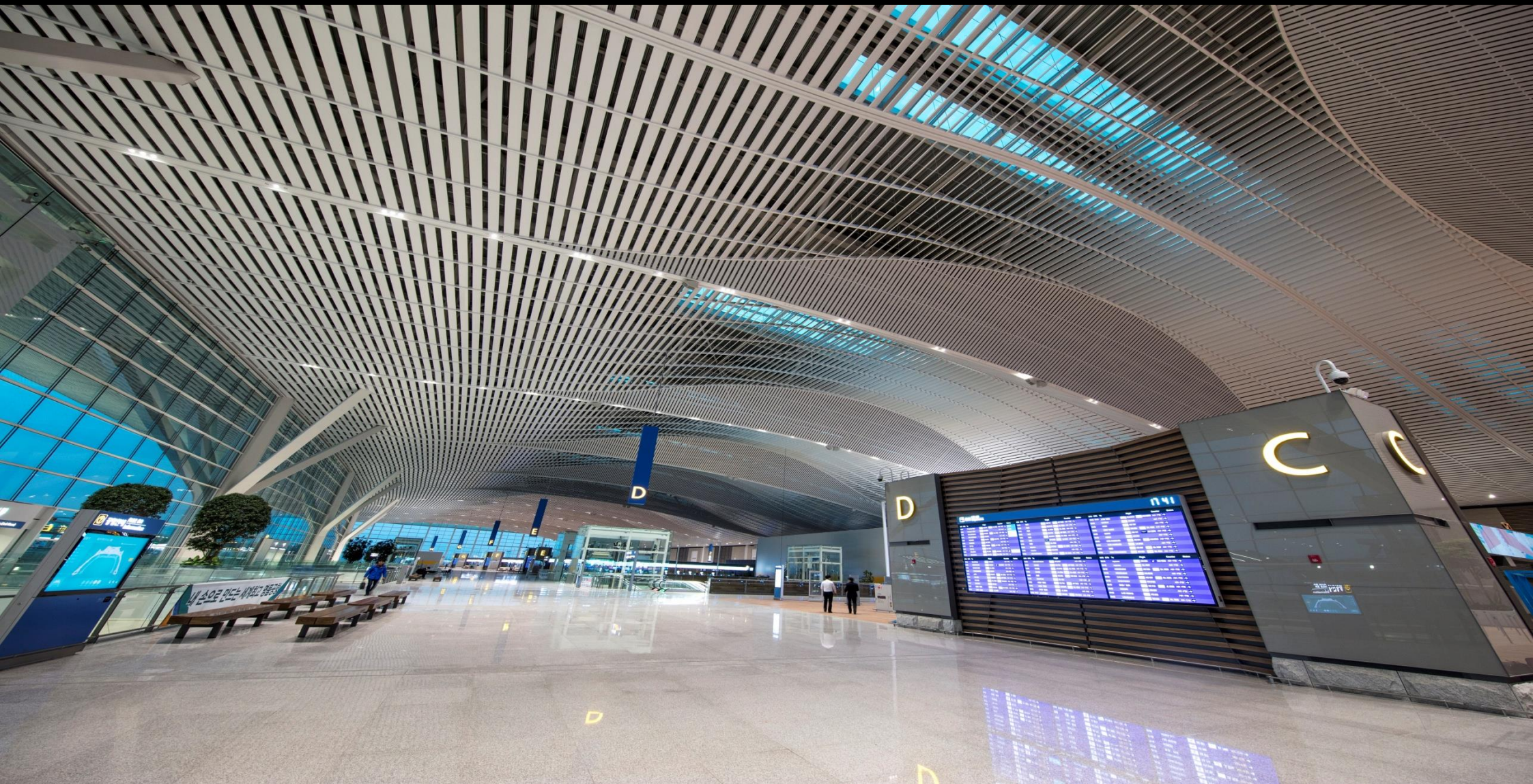
Air Side

Gallery



Great Hall, Departure Floor

Land Side



포토 폴리오



Great Hall, Departure Floor

Land Side

Gallery



Departure Floor
(Tree column / cablette curtain wall)

Curve Side

Gallery



Shell, Transit Area

Air Side

Gallery



Shell, Transit Area

Air Side

Gallery



Shell, Transit Area

Air Side

Gallery



Commercial facility, Departure area

Air Side

Gallery



Commercial facility, Departure area

Air Side

Gallery



Welcome Hall, Arrival Floor

Land Side

Gallery

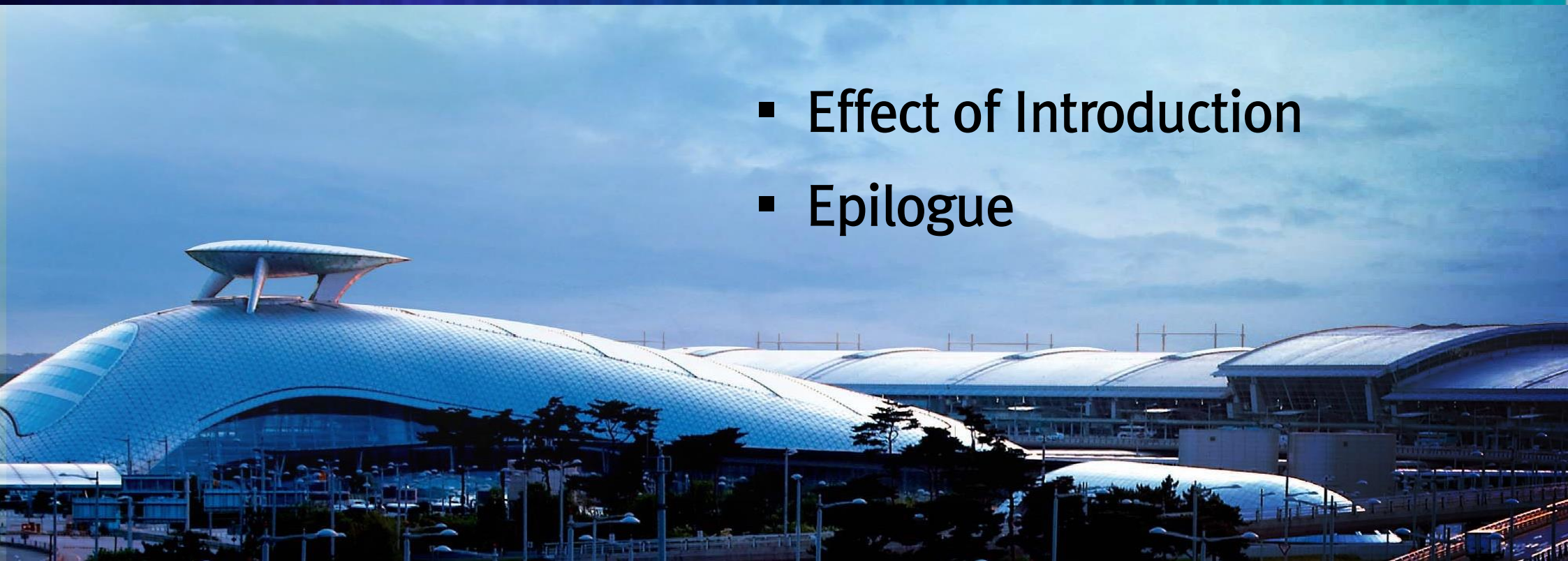


KTX Platform

Facility Area

4. Effect of Introduction and Epilogue

- Effect of Introduction
- Epilogue



Introduction Effect

Integrated project management, introduced for the successful completion of Incheon International Airport Phase 3, enables the followings: minimizing of waste of Total Project cost and ensuring the best quality by construction management such as VE in design stage, risk management, and constructability review from the early stage of the service; preventing faulty construction and ensuring high quality construction in safe environment at by technical support by work; contributing to achievement of Client's target goals by enabling efficient communication among multiple contractors; and enabling consistent support services through overall integrated project management by experts.

Epilogue

Integrated Project Management Service for Incheon International Airport Phase 3 has been successfully completed through the processes stated above in the glare of public attention. This project contributes to the vitalization of integrated project management throughout the entire project period.



SAMOO C.M.

Construction Management



SAMOO.CM.

Thank you

We'll make your time to shine. Go with SAMOO.CM.

Global CM LEADING COMPANY