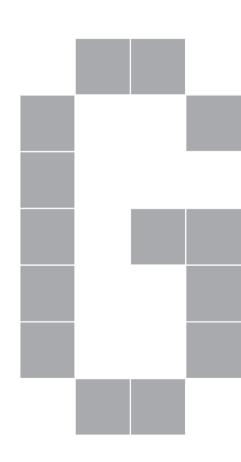
HanmiGlobal CMService Guide Book

Create value for clients through trust and quality





CM Service

Definition of CM



Construction Management Association of America (CMAA)

"A professional management method applied for the purpose of controlling the time, cost, scope and quality of a construction project from inception to completion."

Article 2 (6), Framework Act on Construction Industry in South Korea

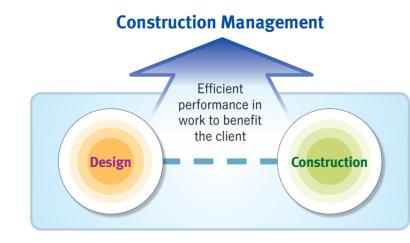
"To perform all or part of the management tasks related to planning, feasibility study, analysis, design, procurement, contracting, construction management, supervision, evaluation, and post-management of construction works."

CM refers to the service of managing construction projects on behalf of the client in contractual terms, i.e., performing the role of agent and coordinator by delegating full or partial authority of the client by contract.

Construction managers, such as CM specialty companies or CM consultants, play the role of general managers by having various necessary knowledge including latest construction methods, market analysis, cost management, process management, etc. and the scope of management covers all areas of project that is planning, design, construction/supervision, and post-management. Therefore, compared to the traditional design-build construction method, CM is considered more active and professional construction management that aims to shorten time, reduce costs, and improve quality by getting involved from the beginning of the project.

CM is the only group that exists for the benefit of the client

amongst entities involved in construction.



CM vs PM

The definition of CM is often confused with Project Management or Program Management, but in general, they can be distinguished as follows.

Program Management (PM)

Program Management is the overall management of a large, long-term project or a complex group of projects with multiple projects running simultaneously, and the scope of project management covers all phases of a construction project, from feasibility to maintenance phase.

Project Management (PM)

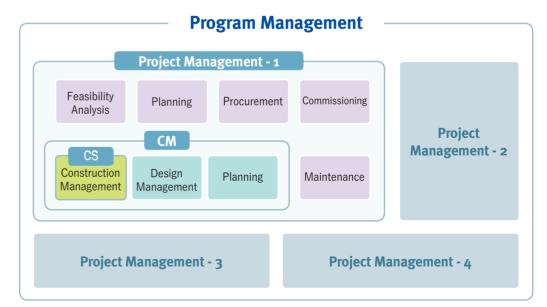
This refers to project management in general and is a technique for effectively managing the entire project lifecycle, including planning, design, procurement, construction, and commissioning etc.

Construction Management (CM)

Initial Role of CM was to manage construction phase of the project, mainly in the construction sites. The concept was established in the industry even before project management. In South Korea, it is usually referred to construction business management, responding to overall construction project management that has the scope of work aligning with project management.

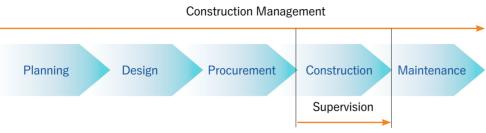
CM, PM, and Program Management in the Construction Business

In the construction business, program management is the broadest management technique that includes project management and CM. Therefore, in terms of the structure of the contract, there are various forms, such as a project management contract or CM contract, a design-build (DB) contract, a conventional lump sum contract under program management contract, and additional CM, DB, or lump sum contract under project management contract.



CM vs Construction Supervision (CS)

The main difference between CM and CS is the scope of work: CM involves all phases of a construction project, while CS is only involved in the management of the construction phase. Given that the success of a business is determined during the first half of the project, the difference between CM and CS is evident. CS cannot be ignored as it is also a legal system that was created to detect and monitor problems during the construction phase.



Work Scope of CM and CS

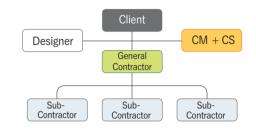
Project Phases		СМ	CS
Pre-Design Phase	 Distinguishing project phases Arranging execution of the design contract Development of procedures for handling, maintaining, and managing design work products Establish, manage, and revise the overall project schedule Estimating total project costs 	•	
Design Phase	 Design schedule and progress management Review of design documents Cost reduction through Value Engineering (VE) Constructability review Construction cost estimation Documenting construction and equipment purchase schedule for construction phase Documenting project cost report 	•	*
Procurement Phase	 Announcement of bids and distribution of bidding documents Guide bidders and conduct briefing sessions Perform pre-qualification Conduct pre-qualification screening and assist in selecting the winning bidder Updating the overall project schedule and project cost report 	•	
Construction Phase	 Prepare and execute recording keeping procedure of documents Review process management, conduct process meetings, and report process progress Progress audit Review and confirmation of the quality management system created by the contractor Participation in various tests Cooperation in construction contract modification Overseeing legal and regulatory items related to subcontractor Preventing or handling claims Managing as-built drawings 	•	•
Post - Construction Phase	 Coordinate commissioning Preparation of O&M related manuals Organizing, delivering and training various documents related to the project Overall post-project evaluation Preparation of project cost summary report Preparation of other finalization reports 	•	•

Types of CM

Unlike other contract types, CM can take many different forms depending on the client's objectives and needs. CM can be broadly categorized into three types: Agency CM, CM for Fee, and CM at Risk contracts, but there are many variations depending on how each construction entity's responsibilities are defined.

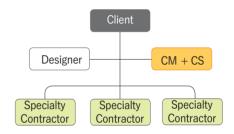
► General CM (Agency CM)

In all stages of planning, design, procurement, construction, and maintenance of construction projects, CM as an agent, manages and coordinates the construction of buildings that meet the quality required by the client within the given budget and time. Through CM, the client can minimize the size of the organization by entrusting the entire process of construction to the CM.



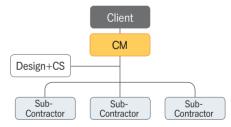
CM for Fee

Unlike general CM, in a construction project where the client contracts with several contractors, CM oversees and manages the construction as the client's representative, and thus the client, designer, and CM forms a team. Specifically, CM contributes to the successful execution of the project by reviewing the design, adjusting the cost and schedule, guiding procurement and bidding process, and managing the construction project in general.



CM at Risk

CM directly contracts with sub-contractors to be partially or fully engaged throughout the construction phase, or the contractor acts as the CM. In a CM at Risk contract, CM usually promises a *Guaranteed Maximum Price (GMP) to the client, and then assumes responsibility and risk for the construction cost and workmanship of the project by directly taking charge in large part of the construction.



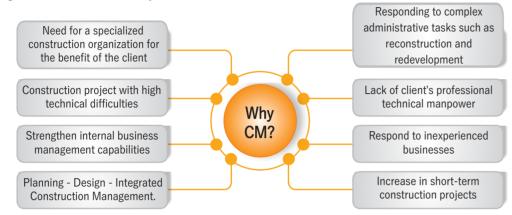
* Guaranteed Maximum Price, GMP

project manager bears the risk of procuring the project within the budget agreed in advance. If the construction cost exceeds GMP, project manager bears the excess unless there are special circumstances.

Necessity and Benefit of CM

Necessity of CM

Construction management (CM) is a naturally occurring project management method that responds to the challenges of the construction industry.



CM's Role

- Maximizing the client's interests as the client's representative
- The CM provides the following benefits on behalf of the client.
- Minimize the size of construction organizations and technicians.
- Minimize the client's work through total service.
 Maximize client profits by reducing construction costs, shortening time, and improving quality.
- Supports optimal decision-making through professional and independent analysis and evaluation.
- Systematic project cost management

Even in the case of large-scale national projects led by national organizations, it is not uncommon for project costs to exceed the project budget by two to three times. This may be due to the fact that the project budget establishment at the planning stage and the budget management (cost planning) at the design stage are not done properly. If systematic project cost management is done from the planning stage, the client can proceed with the project with peace of mind.

Scientific and reasonable project schedule management

Meeting or shortening the project schedule is one of the most important factors that determine the success or failure of a project. A proper business schedule should be established through proper harmonization of the overall schedule and budget. Unnecessary shortening of time can cause quality degradation or serious safety accidents, so it is necessary to have a systematic and scientific process management by putting in process management experts from the design stage.

Integration of design and construction

In a typical project, the interests of the client, designer, and contractor are often at odds. Against this backdrop, CM have specialized knowledge of design and construction to integrate all parties. By integrating all participants with specialized knowledge of design and construction, CM reduces disputes and leads to successful project execution.

Improving design quality and managing design schedule through design management

Improving the completeness of design quality can eliminate reconstruction and defects in the future construction phase in advance to realize perfect quality. In addition, it is the main task of the construction project manager to coordinate/consult with the designer on the design schedule, including permits, and manage the design schedule so that there is no disruption to the design schedule.

Maximizing Constructability

Constructability refers to the degree to which construction knowledge and experience is optimally utilized during the execution phase of the entire project. For designers to achieve the objectives of these complex projects, it is important to maximize constructability, and it is important that CM with construction knowledge and experience are involved early in the project.

Effects of CM

Based on their professional experience and management capabilities, CM can prevent conflicts of interest and lack of communication between project participants in advance, provide consistent management from the client's perspective, and ultimately help the client in making best decisions.

Provide consistency in overall project management.

Projects often fail due to communication problems and lack of consistent management between the project participants and the client. CM helps in providing consistent management from the client's perspective with backgrounds in professional experience and management capabilities.

Cost reduction through VE and constructibility reviews throughout the project

Based on their expertise and experience, CM help reduce unnecessary expenditures and ultimately create the best building for their clients through Value Engineering (VE) and Constructibility Review, i.e. improving functionality or reducing project costs compared to their peers.

Fast-track approach to reduce time and business flexibility

"Fast Tracking" refers to the overlapping of design and construction phases. This is one of the most prominent benefits of adopting CM, resulting in substantial savings in time and construction costs, greater project flexibility, and avoidance of prolonged uncertainty.

Delivering projects within budget

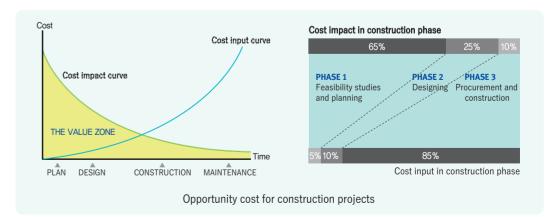
Most clients have no or weak expertise in construction budgets, and as construction progresses, it is easy to have disputes over construction cost increases or settlement issues. CM can verify budgets based on their knowledge and experience and manage unnecessary budget increases or design changes to ensure that projects stays within budget.

► Provide real-time information

Success and failure of a project is dependent upon the efficiency and promptness in sharing information regarding the progress. By collecting and analyzing the necessary information and ensuring that it is delivered to the project participants in a timely manner, CM can increase the speed and efficiency of information sharing.

Enable rational and timely decision-making

Clients who lack information regarding construction are often prone to making wrong or delayed decisions, which can derail the entire project execution schedule or cause disputes. Therefore, CM provide technical advice on these issues and make timely decisions to avoid project from failure.



Professional services by discipline

Feasibility Study

Feasibility study is an important part of business planning, as considerations over business cost, financial support, income and expense prospect, profits and losses, and sources of self-financing are all taken into account.

Its purpose is to clarify the feasibility of the business beforehand, so that the client can make decisions related to investment. Simultaneously, it is also important to clarify the risks and problem factors, and to clearly revise the conditions and goals in establishing the business.

Key tasks

Phase 1 Market Research

Phase 2 Business feasibility analysis

Agendas to review (Macroscopic viewpoint)

- Economic Conditions / Key Economic Indicators
- Demographic characteristics
- Status and trends of domestic and foreign investment in South Korean market
- Legal conditions that affects foreign investors Infrastructure to support the project
- Investment status / neighboring development
- plans - İmpact of the above factors on development

Issues to review (Microscopic viewpoint)

- Regional review of the development sector
- Detailed geopolitical characteristics of major competing projects
- Supply adequacy issues / expected future demand
- History of expected investors/users
- Asset value

Research on prospective investors

- Research on existing operators in the local market
- Benchmarking of relevant overseas projects and consultation with companies
- Estimated breakdown, estimated real estate parcel value Asset value

Project site analysis

- Analysis of location/geographical characteristics
- Survey of neighboring facilities
- Primary transportations and travel patterns near site
- Development in constraints (i.e. administration. environment, parking)
- Infrastructure and neighborhood conditions

Positioning

- Establish a positioning strategy
- Review in development plan and its role in the development area
- Determine the best project configuration and positioning on the market
- Explore ways to maximize floor area ratio

- Investment model
- Review the project's budget - Proposing and evaluating asset values for each
- floor Estimates based on data from market research

Profitability analysis

- Final yield maximizing cash holdings - Return on total expenses (each in excluding and including real estate)
- Total expenses excluding real estate (including interest) Total expenses including land-related expenses and interest
- Present net value of total income Internal rate of return

Creating business plan

- Set a maximum profit target - Establish a land use program based on market analysis
- Develop and execute a plan to achieve maximum profit at minimum cost
- Secure financial sources and develop a financial management plan

Creating a master schedule for development

- Establish a master schedule - Determine timing and prioritize tasks for a
- cost-effective development plan - Determine appropriate project phase for coherent financing

► Financing and investment

- Investment counseling in the domestic market (identify financial support from export financing, banks/insurance companies, etc.) - Investment counseling with overseas investors

Review in other matters

- Review in best utilization
- Review in ways to utilize it for various purposes

Design Management

Design management starts from identifying the needs of the client, understanding the goals of the project, and establishing design criteria so that the goals can be shared with all design-related parties.

In addition to managing the creation of design outputs in consideration of the overall project schedule and appropriate work period, it is to maximize effects in improving design quality, minimizing design errors, and reducing construction and maintenance costs through smooth communication between design-related parties, thus ultimately providing the best quality and service to the client through management activities throughout the design.

Key tasks

Owner's Requirements Management

Identify the goals, policies, and requirements of the business to set design criteria, create design guidelines and manage the design process accordingly.

- Identify the client requirements
- Document a design brief
- Document project management plan - Design evaluation focused on the reflection of
- the requirements

► Design Schedule Management

Schedule management in the design phase aims to comply with the overall project schedule and further shorten timeline performing the following tasks for thorough design schedule management.

- Review of appropriate design and permitting schedules
- Design schedule management considering review/revision/approval process
- Design schedule management considering procurement/contracting and construction
- Prioritize long lead items
- Design schedule management considering construction schedule when applying Fast Track method

Design Quality Management

A technical review is necessary for the achievement of goals and efficient management in time, cost, quality, etc. The followings are main points to consider.

- Review of overdesign
- Economic and constructability review
- Review of conformity of the construction documents
- Review of the completeness of the construction documents
- Review whether site conditions are reflected
- Consideration of the interrelatedness of each type of construction (architecture/structure/ facilities/electric)

Cost reduction

Cost reduction efforts can be applied at any stage, but has the greatest impact if applied in the early stages of a project.

- Value engineering (VE) experts review cost reduction measures
- Review precedents in VE
- Suggest cost reduction items with specific measures

Project cost management

We manage the project to stay within the budget and review the project cost at each stage of design to ensure that the project cost does not exceed the budget.

- Feasibility study and budgeting
- Predict and estimate construction costs for each stage of design
- Design adjustment: Support the client's
- decision-making by presenting alternatives through comparison of construction cost differences for each design alternative
- Application of VE techniques
- Improve accuracy of construction cost estimation

► Adjustment of DD/CD and review of linkage

If there is a conflict between client requirements and designer's opinions or disagreement between the parties involved due to technical problems in the design, a project manager with rich experience and gualifications plays a coordinating role in architecture and related engineering fields.

- Coordination role as Design Coordinator
- Review of various technical reports
- Review of relevant laws and regulations Review of new construction method and special
 - construction method application plan - Review of Space Program

Cost Management

From project initiation to completion, we protect the client's interests and find investment value through budgeting, cost planning, cost reduction, optimal contractor selection, design change and settlement management, and risk management.

Key tasks

Project Cost Management

We perform reasonable project cost management tasks to prevent the client's budget from exceeding and to achieve balanced expenditure of project costs through budgeting and cost planning during the planning and design phase, cash flow management during the construction phase, progress audit, design change and settlement management, etc.

Planning and Design Phase	Construction Phase	
 Budgeting Managing construction costs through Cost Planning Cost Plan → Cost Check → Cost Analysis Comparison of construction costs between budget and cost plan Analyze major factors affecting construction costs Comparative review of construction cost by design alternative Suggest appropriate construction cost by creating or reviewing design specifications 	 Financial Monitoring & Reporting Cash Flow Management Progress Audit & Certification Change Order Evaluation & Control Claim Management Final Measurement 	
 Order management Ensure that the best contractor for the project is bidding on the project, and that the most 	 Value Engineering (VE) During the design process, VE reviews and ensures that construction costs, maintenance 	

- competitive contractor is selected to achieve quality construction.
- Establishment of ordering plan (bidding procedure and bidding method, etc.)
- Pre-qualification (researching and determining eligible bidders)
- Preparation of bidding guidelines and bidding briefings
- Receive bids and evaluate bids
- Select and negotiate with preferred bidders
- Assistance in determining the winning bidder
- Preparation of construction contract documents
- Assist with construction contracting



Schedule Management

Schedule is set and managed in the manager's viewpoint. It not only includes management of process during the construction phase, but also design, purchasing and procurement, and decision-making schedules upon review and approval. It utilizes construction technical knowledge and computer software to manage the overall schedule of the project and facilitate the progress of the process on site to shorten or comply with the project schedule.

Key tasks

Apply CPM techniques using Sure Trak or Primavera programs for efficient process management.

- Master Schedule review/consultation for the entire project schedule
- Comprehensive management of business schedule using Fast Track
- Review/management/record-keeping/analysis/update of comprehensive fair value table
- Manage and review the preparation of short and long-term financial statements (30-day, 60day, 90-day financial statements)
- Milestone-oriented process management of critical path and major activities
- Identify/manage work progress against the main process table and create/submit reports
- Establish measures to analyze process impact due to design changes
- Consultation and management of compensatory measures in case of process delays

Step-by-step tasks

The steps of process management are as follows.

 Create a Process Control Procedure Complete various schedule data systems Finalize process control level Finalize WBS and Code system Review in full construction period creating master schedule Establish design management schedule 	 Setting project milestone Interim Management / Activity / Setting management routine Derive Activity and connect Logic Process impact analysis by design alternative and Establish countermeasures Setting baseline schedule for framework 	 Setting baseline Schedule for finished work Setting baseline Schedule for electrical/facility work Documenting and managing consolidated and combined statements Operation of total process management system Establishment and operation of measures to recover inactive processes
Design Schedule Management The following tasks are performed to p delays and poor construction due to de – Manage and analyze various data sub	esign delays. Apart from the follow items.	ead Item Management n process management for construction, <i>v</i> ing tasks are performed for long lead

- ivianage and analyze various data submissions from designers
- Establishing a system for timely decision-making
- Identifying design progress in advance and
- requesting a release
- Analyze the cause of design delays and establish countermeasures for construction types or matters - Early resolution of design issues through technical support
- Identify materials with long procurement time
- Investigate the procurement period for each material
- Create a process table for procurement by material
- Reviewing whether the procurement schedule meets the construction schedule planning requirements
- Suggest ordering method (classify orders for both client/builder)
- Propose ways to deliver in a timely manner
- * Long Lead Item : Materials or equipment that take a long time to purchase and procure

costs, etc. are at its most economically efficient level to derive the design. We continuously review whether there are more efficient alternatives in terms of economic and functional aspects.

> Function Value = Life Cycle Cost

Claim Management

The purpose of claim management is to minimize unnecessary time and financial losses by fundamentally blocking the draining factors caused by claims or disputes during project execution. It identifies disputes or claim factors in advance through expert advice or judgment and proposes solutions or countermeasures for each. In addition, it acts as an impartial arbitrator for disputes that arise to minimize the adverse effects on the project.

Key Tasks	Claim analysis	Exact purpose / Degree of culpability of both parties Requests for proof of expenses / Requests for detailed calculation basis Review of various documents / Cost review / Process review
	Negotiation Strategies	3F (Firm, Fair, Friendly, Friendly) Unify speaking channels / Utilize notes / Seek alternatives to resolution Keep emotions in check / Process quickly / Start with the easy stuff / Negotiate major points separately
	Anti-Claim	Review Anti-Claim to offset or reduce claims as needed

QIT (Quality Improvement Team)

The QIT (Quality Improvement Team) system is a new type of quality and safety management program that Hanmi Global introduced after evaluating series of large construction accidents in Korea. It is made by assessing and reflecting contracts signed with companies in developed countries. The QIT program is operated with the goal of preventing the recurrence of similar accidents by identifying problems that cause such accidents in advance and taking preventive measures.

Key Tasks	Scope of work	Quality and Safety Oversight Technical consulting services
	Performance	Meets the fundamental goal of ensuring the structural safety of buildings Suggest upgraded quality and safety standards to be applied on site Improvement of site operation system and raise in awareness of quality and safety Role of incorporating advanced construction technologies into the Korean construction industry

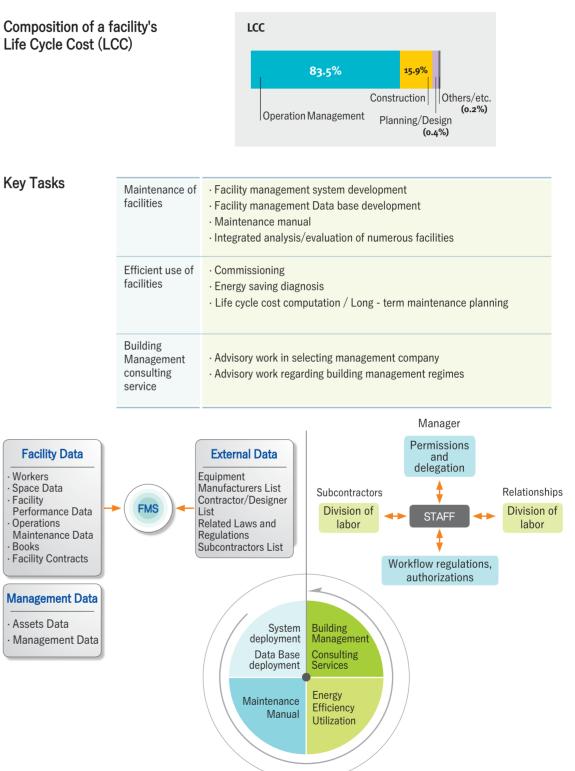
LTA (Lender's Technical Advice)

Lender's Technical Advice (LTA) is a service that provides technical advice in a specialized field to protect the interests of investors who have invested capital in a project. It is provided throughout the project implementation process, design review, project cost management, existing fund adequacy review, and establishment and management of work division standards for project participants, which greatly improves the investment stability of investors.

Key Tasks	Pre-Con Phase	Construction Phase	Post Construction Phase
	 Design Suitability Review Project Budget Adequacy Review Project Schedule Review Review Contracts, Purchase Orders 	 Managing Design Changes Project Cost Change Management Quality, process, and safety management Specialized technical advice Keeping payments and process rate adequate 	 Commissioning Plan Review Review of the As-Built Inspection Plan Facility handover review FMS implementation, operation review

Facility Management

Facility Management provides various FM services as an area of CM business that can maximize the value improvement of facilities as assets by reducing LCC of facilities through the establishment of an optimal facility management system, supporting the reduction of running costs of facilities and the establishment of an advanced facility information network.



High-Rise Building Technical Services

High-rise buildings were once dominated by North America, including the United States and Canada. However, since the 1990s, Southeast Asia, including Hong Kong, Singapore, Malaysia, Taiwan, and China, has been at the forefront for more than a decade.

If you look at the development of high-rise buildings in Korea, you will find that it is different from that of other advanced countries. First, it started abruptly after the IMF, mainly for residential facilities, by construction companies without sufficient accumulation of design, construction, and management skills required for high-rise construction. Second, it started when social infrastructure for high-rise construction was not in place, i.e., relevant laws and regulations, disaster management systems, and social consensus. For these reasons, key factors in construction projects such as research and development of elemental technologies and core technologies required for the design of high-rise buildings, as well as design management, cost management, and project schedule management, have not yet exceeded the generic level.

Scope of Work for Skyscraper Technical Services

 Design Management 	Design management is a key factor in high-rise construction, as it involves large investments. Therefore, effective and sufficient coordination between each division during the design process is required in resolving problems such as delayed decision making, design changes during construction, design incompleteness, project delays,
	and increased costs.
 Cost Reduction and Value Engineering 	Cost reduction and VE in high-rise construction should be carried out in all areas by high-rise specialists, starting from planning and design phase, through construction planning and process planning.
 Construction Planning 	The most important items in the construction plan of a high-rise building are the elevation and the framing plan. Since high-rise framing work is carried out in a fast cycle, it is essential to review the equipment and construction method in connection with the applicability of the formwork system.
 Process Management 	Management of cycle process is essential in high-rise constructions. It is absolute necessity to apply cycle process method from the design stage with prerequisites in securing consistent and repeatable construction environment through regularity in design elements, adoption of construction methods that maintains equal speed of work, promptness in supply of personnel and materials along with systematic support.
 Elemental Technologies for High-Rise Construction 	 Preceding with core structures, Assembling Rebar Wire, Reviewing key construction methods such as flat plate slabs Assist in window and glass durability, condensation, and soundproof consultation Providing technical documentation on elemental technologies such as insulation, noise, lightweight partitions Reviewing Column Shortening

- Reviewing 2–4-day framing cycle technology application

- Disseminate relevant technologies through workshops



Key Accomplishments

► Major Completed Projects



Tower Palace I, II, III (45~69F)

Hyundai I-Park, Samseong-dong (47F) We've the Zenith, Daegu (54F)





SK-View, Oryukdo (47F) Centum Star, Busan (58F)

The # Star City, Gwangjin (58F)

► Major Projects in Operation











LOTTE Super Tower, Jamsil (123F / 555m) Metropolis, Dongtan (66F)

We've the Zenith, Haeundae (80F



HanmiGlobal

위 135-090 서울시 강남구 삼성동 159-9 도심공항타워빌딩 9층TEL 02-3429-6300 | FAX 02-3429-6363 www.hmglobal.com

HanmiGlobal Consulting(Shanghai) Co., Ltd. Room 2602, Tower B, City Center of Shanghai No.100 Zunyi road, Shanghai 200051, China

HanmiGlobal Macau Ltd. Suite F, 7th Floor, Zhu Kuan Building, 105 Avenida Xian Xing Hai, Macau

HanmiGlobal Vietnam Co., Ltd. 173/36/12D1 Duong Quang Ham, ward 5, Dist Go Vap.

Hanmi International KSA (LLC) P.O.Box 230942, Riyadh 11321, Kingdom of Saudi Arabia

Hanmi International Construction Project Management (LLC) P.O.Box No.33763, Office No.204, 1st Floor, The Emirates Tower, Hamdan Street, Abu Dhabi, UAE

Hanmi International Middle East Facilities Management (LLC) P.O.Box No.502862, Office No.1413A, Grosvenor Business Tower, TECOM, Dubai, UAE

Libya Branch, HanmiGlobal Co., Ltd. Flat 14, 5th FL., Aledikhar Bank Bldg., Ahmad Shaoqe Street, Tripoli, Libya

