

Program Management in Korea



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originated and western countries and it is widely considered that PM is a wider concept. In the U.S., Construction Management controls a single project from construction documentation to commissioning while Project Management controls from planning to commissioning stage. Program Management, a superior concept to the former, is adopted for very large or multiple projects. Table 1 is Parsons Corporation's internal data which shows construction delivery methods for a project.

According to ENR magazine edition of June 13, 2005, there are four basic models of Program Management in the U.S. First is 'Owner PMO', where the owner adopts its own management program and hires a PM firm to assist it. The next is 'PM Lite' where an agency has some staff in place and hires a PM firm to fill in the gaps. Then, there is the 'Integrated PM Model' where an agency sets out a series of tasks and assigns these tasks either to its own staff or a PM firm to manage. Finally, there is 'Owner-agency replacement' where the PM firm is hired to take over management of the program.

1. Definition of Program Management

The Program Management is the centralized coordinated management of a group of projects to achieve the program's strategic objectives and benefits. It controls multiple projects en bloc for a combined project like an airport construction which is comprised of many bid packages and covers all phases from planning to maintenance. Construction Management is separately used from Project Management in the U.S. where CM

2. PM in the U.S.

Clients have become even more demanding in recent years. As they began to ask for needs analysis, planning, siting, permitting, financing, commissioning and the like,

Stage of a Project	Notes	Planning	Concept	Design	construction	Commission	Examples
Program Management	1						New Airports, Transit System
Project Management	1,2						Sub-project of above or Separate
Construction Management	1,2						CM For Fee or Agency CM
General Contracting	3						
Construction Supervision	1,2						

Notes : 1. May be Client or Owner's Representative 2. May be subdivision of the Overall Program Management 3. Concept, Schematic and Design Development Provided by Others

Figure 1. Construction Delivery Methods

Program Management has been widely adopted by owners for the last couple of years. PM has been around since the 1950s in the U.S. but as huge capital programs in the public sector increased, PM grew rapidly.

Upgrading public infrastructure is greatly demanded and since PM is adopted when there is a great amount of capital spending left with no staff to manage, the outlook of PM is more promising in the public sector than in the private sector. However, some firms are doing well in the private sector. Hoar Construction has adopted PM for adding 40 new banks a year for Regents Bank and saved hundreds of thousands of dollars on each branch. Construction Management & Development, one of the most successful CM-for-Fee firms, is engaged in large scale complex residential buildings and commercial buildings and is performing PM for Brannan Square in San Francisco, Grand Pier and the 1.2 billion dollar Riverside Park Project in Chicago. BSW has also provided PM for 4,000 Walmart store projects for the last 20 years.

US Top 20 CM-for-Fee firms made 2,482.5 million dollars in Program Management services, 48.6% of their revenue totals. Their revenues between CM and PM were almost evenly made which means they are actively involved in PM markets. In particular, CH2M Hill Cos. Ltd, which tops the CM-for-Fee List, made their total revenue of 699 million dollars from PM in 2004. Eight firms out of the top 20 CM-for-Fee firm list including Parsons made more than 70% of their revenues in PM. In the U.S., Program Management is a very useful project delivery method widely used in both the public and private sectors.

3. Program Management in Korea

CM has just been adopted in the public sector since 1997 after construction laws were amended and therefore, there are only few projects for which Program Management was used. If PM is defined according to the US standard, the Incheon International Airport and

Table 1. Percent of The Top 20 CM-for-Fee Firms' PM services

RANK	FIRM	2004 REVENUE(\$ MIL)		
		CM	PM	Rate(%)
1	CH2M Hill Cos. Ltd., Denver, Colo.	699.3	699.3	100.0
2	Parsons Brinckerhoff, New York, N.Y.	524.2	347.5	66.3
3	The Turner Corp., Dallas, Texas	424.8	-	-
4	Parsons, Pasadena, Calif.	420.4	308.1	73.3
5	URS, San Francisco, Calif.	401.8	104.1	25.9
6	Bechtel, San Francisco, Calif.	399.0	62.0	15.5
7	Jacobs, Pasadena, Calif.	389.3	-	-
8	Washington Group Int'l, Boise, Idaho	280.0	252.9	90.3
9	Bovis Lend Lease, New York, N.Y.	260.7	38.6	14.8
10	KBR, Houston, Texas	164.3	134.5	81.9
11	Foster Wheeler Ltd., Clinton, N.J.	154.0	58.0	37.7
12	Tishman Construction, New York, N.Y.	143.1	-	-
13	Heery International, Atlanta, Ga.	142.4	132.0	92.7
14	HNTB Cos., Kansas City, Mo.	127.2	71.1	55.9
15	Jones Lang Lasalle Inc., Chicago, Ill.	116.6	-	-
16	Black & Veatch, Overland Park, Kan.	102.3	66.4	64.9
17	PBS&J, Miami, Fla.	97.8	-	-
18	Hill International Inc., Marlton, N.J.	88.5	45.0	50.8
19	Tetra Tech Inc., Pasadena, Calif.	88.0	88.0	100.0
20	Earth Tech Inc., Long Beach, Calif.	83.0	75.0	90.4
Total		5,106.7	2,482.5	48.6

Kyungbu Express Railroad can only be categorized as Program Management Projects. However, due to lack of technology and experience of Korean firms, these projects were carried out by foreign companies or through consortium with foreign firms. They were very special cases since PM was adopted by strategic decisions of the clients even before CM was introduced in the public sector. If the Relocation of US Forces project which is worth six trillion Won is to start by the end of 2005, it will become another government project that Program Management will be adopted considering its scale, diversity and characteristics.

In the private sector, PM is being adopted for large discount store projects. Britain-based multinational firm, TESCO entered the Korean market in 1999 and adopted CM delivery method for its 45 'Home Plus' discount store projects. HamiParsons has successfully performed CM for building 28 of them and is providing Project Management and Program Management services for its 5 other projects in process and 10 projects in the planning phase.

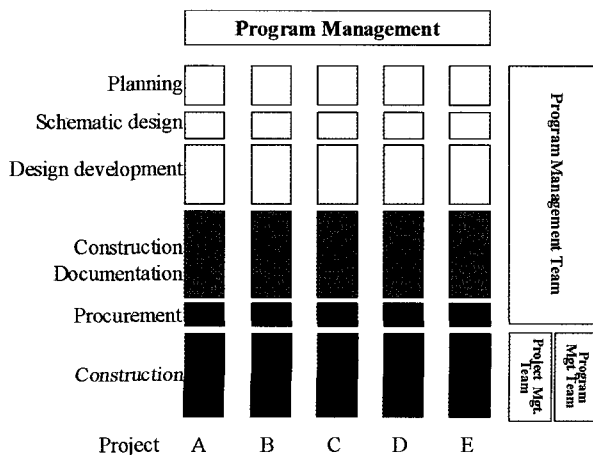
4. Program Management for Home Plus Discount Store Projects

This paper describes PM in the Korean construction industry through Home Plus Projects where Project Management and Program Management are adopted simultaneously.

4.1 Organization

The organization for Home Plus projects is made up of Program Management Team and Project Management Team. The Program Management Team, an integrated team of staff from the owner and CM firm, controls pre-construction phase works at the head office. The Project Management Team controls each construction phase of projects on site and the owner has minimum site staff (PM) working by regions while the Project Management Team of a CM firm handles all site works.

The Program Management Team, in order to meet the owner's business motto of 'Better, Simpler, Cheaper', completes pre-con phases of planning, design and procurement and the Project Management Team will take over construction phase works on site. The works done by the both teams will be shared through thorough transfer of control and meetings in the construction phase. Therefore, VE performed in the construction phase will be applied to the current site or the next site which doubles cost and time saving effects.



4.2 Major Works

(1) Program Management Team

1. Planning Phase

The team's primary work in this phase is to review a new store opening plan. The team helps the owner build the best store by checking the plan for feasibilities including location conditions, economy, budget and possibility of further extension and presenting its comments. Another major service of the team is Pre-design Review. It reviews schematic designs and holds relevant meetings prior to applying for project permit. It also controls designers' works while coordinating the owner's design team and construction team to draw up the best store plan.

2. Pre-construction Phase

The Program Management Team controls design, cost, schedule, and contract. All the works carried out by the Team in the phase are handed over to the Project Management Team before the start of construction phase and the latter controls them until the project is completed.

3. Design management

The Team coordinates designers of each discipline (architectural, structural, mechanical and electrical) and reviews designs 4 times in each permitting process. It also controls design schedules, holds design meetings and manages change orders of the owner. Through these works, the team saves design period and improves the completeness of designs to attain the best designs.

4. Cost Management

Cost Management aims at getting the best design within the given budget. The Team prepares cost plans by each design phase and compares, reviews and adjusts them against the original budget. It also reviews tender prices against the budget and present alternatives. Furthermore, in order to save the budget, the team performs VE through review of design documents and

construction methods and holds meetings with the owner, designers and concerned firms for its application.

The core work of the Program Management Team applied in the pre-con phase of Home Plus projects is to deploy an expert who controls the whole program for systematic design and cost management. In other words, the expert reviews design guidelines and plans to save money and time, conducts Value Engineering Study to choose low-cost and high-efficiency alternatives and reviews the entire Life Cycle Cost to prepare various time and money saving measures. He also reviews constructability in the design phase to figure out potential problems that might arise during the construction phase and considers measures to save time. Table 2 describes design and cost management works in the pre-design phase.

Table-2. Design and Cost Management

	Design Review	VE	Cost Estimate	Time Estimate	Remarks
Concept Design	Concept Completed	●	●		
Schematic Design	Plan+ M.D Lay Out	●	●	●	●
Perform VE based on DR					
Design Development	50% progress	●			
Order designers to change designs based on DR					
	100% done	●			
Construction Documentation	85% progress	●	●	●	
Order designers to change designs based on DR					
	100% done	●	●	●	Final BOQ ●

Program Management for Home Plus Projects aims at standardizing design documents and saving costs through VE. Since the owner will keep on building new stores, it is very crucial to improve constructability by reviewing adequacy of existing design manuals and plans and standardizing them in terms of cost and time savings. Also, cost saving through VE is a very important issue for its discount store business down the road. Table 3 shows cost savings through VE in the pre-con phase of capital area projects between September 2002 and August 2003 and 2 to 3% of the construction costs was saved.

Table 3. Cost Saving by VE at Pre-construction Phase

Unit: 1000 Korean Won

	"D" Store	"E" Store	"G" Store	Remarks
Civil work			8,808	
Structural work	73,940	35,000		
Architectural work	515,900	230,300	228,600	
Electrical	64,000	31,000	13,000	
Mechanical	392,100	333,000		
Total Saving	1,046,000	629,300	250,400	

5. Time Management

The Program Management Team handles preparation and control of project schedules encompassing site security, permit and start of work plans for new stores. It also prepares and reviews master schedules in the construction phase to observe completion dates. To meet the deadline, the Team prepares, reviews and presents overall project schedules in the Schematic Design and Construction Documentation phases. Besides, it reviews methods and proper schedules of soil and frame works before start of work to control schedules effectively.

6. Contract Management

The Program Management Team addresses bidding work to select contractors on behalf of the owner. It handles reviewing project delivery methods, preparing tender guidebooks and contract documents and holding site presentation meetings and Q&A for bidders. It also reviews tender documents submitted by bidders for adequacy of their technologies and prices to make sure that the most qualified contractor is chosen.

7. Additional Work

In addition to the works above, the Program Management Team reviews proper length of time based on store sizes for effective management and continues to present new construction methods and materials to save time and money while minimizing errors in planning, design and construction phases by keeping revisions of construction laws up to date. It also keeps records of its performance done for each project and controls each project's design reviews, cost and time savings through VE, problems and solutions during bidding and

construction and standardization of designs and construction. Through these additional works, the team contributes to ongoing time and money savings and quality management.

(2) Project Management Team

The Project Management Team covers all of the construction phase works from start of work to handover. Since continuous time and cost saving efforts are demanded due to proprieties of the discount store project, the team controls schedule, cost, change orders, quality, safety and handover in the construction phase. The Team will perform similar projects for the owner down the road and therefore, it is also one of its major works to keep records of problems and improvement points they experienced in the construction phase and offer alternatives for effective delivery of future projects.

8. Schedule Management

Schedule Management is very important for Home Plus Projects since their opening dates should be observed. Also, in most of the project cases the shedule is very tight(11.6 months on average) and the total floor area is very large(14,460 pyeong per project). Therefore, the Project Management Team makes the contractor prepare the construction schedule in accordance with the master schedule drawn up by the Program Management Team and reviews adaptability of the schedule for approval. In order to make sure that the schedule is effectively managed, the Team also reviews schedule management methods and organizations of the contractor for their adequacy and integrates schedule management and cost management. The Team holds weekly and monthly schedule meetings where it reviews schedule progress, prepares measures to recover lost time when the schedule is found to be more than 10% behind the plan and manages schedules where change orders arise in order to meet the completion date. Since sticking to the completion date is very critical, the team prepares separate detailed progress schedules for finishing work and interior work to prevent time delay.

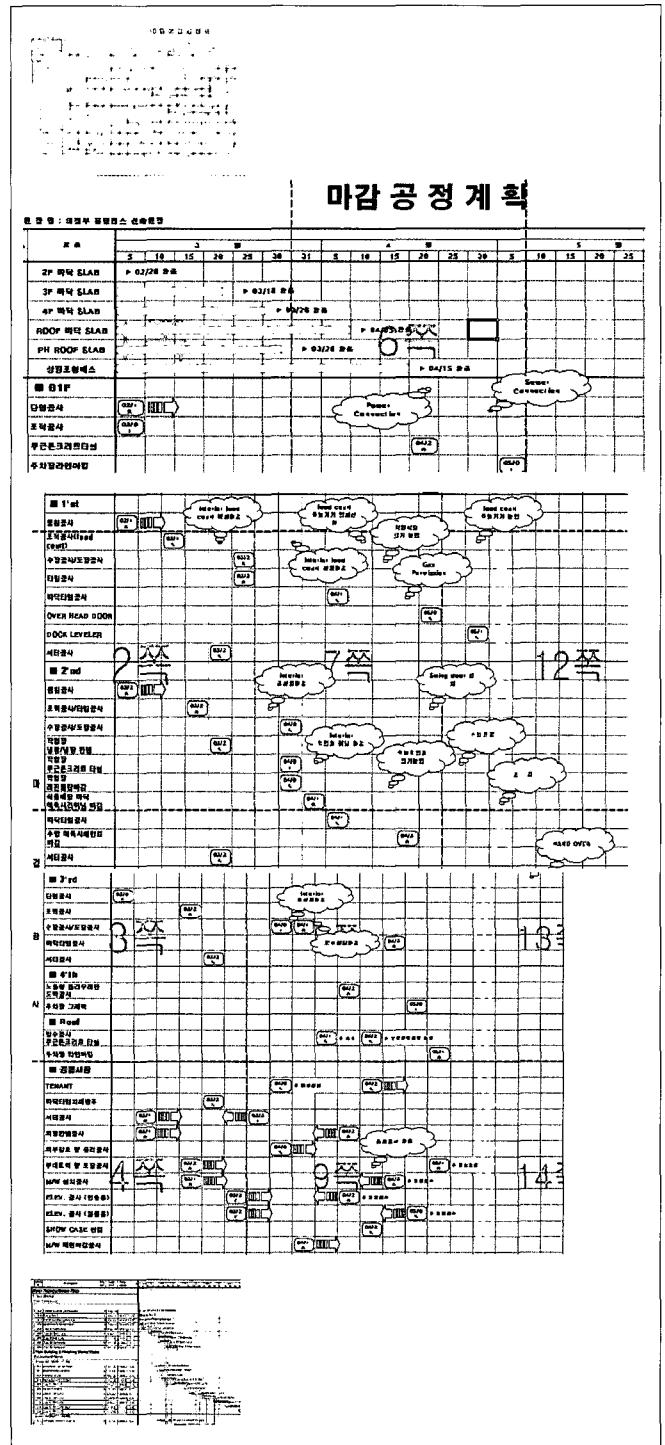


Figure 3. Master progress schedule, Monthly schedule, Fishing work schedule

9. Cost Management

The Project Management Team focuses on achieving ongoing money savings by finding items where VE can be applied through review of design documents and technologies. It also clarifies the procedures to handle

change orders submitted by the contractor and minimizes cost hikes caused by the change orders by tapping into assistance of the cost management team from the head office and collected price data. Table 3 displays further money savings through VE in the construction phase.

Table 3. Cost Saving by VE at Construction Phase
Unit: 1000 Korean Won

	"Y" Store	"E" Store	"C" Store	Remarks
Civil work			30,000	
Architectural work	136,500	305,000	102,000	
Electrical	82,200	153,000	100,000	
Mechanical	215,900	184,500	224,300	
Total Saving	434,600	642,500	456,300	

10. Change Management

The inadequate or redundant design are usually removed through Design Management in early stages of the design phase by Program Management Team. At construction stage, Project Management Team tries to minimize change orders and controls inevitable design changes that arise in compliance with change order request and approval procedures that were agreed between the owner, CM firm and contractor before start of work. The team reviews in detail approved change orders to analyze time impact and cost impact that they might cause and states its analysis results in monthly reports to clarify limit of responsibilities for the impacts. The team also makes preparation for potential claims in the future through systematic document control pertaining to change orders.

11. Quality Management

The Project Management Team concentrates on proactive quality management activities based on the quality management plan that was prepared by the contractor and approved by it. Its major works are inspection on key areas, inspection and approval for major materials and thorough control of non-compliance items. Inspection work is conducted according to the inspection request submitted by the contractor and then documented. When approving materials, the Team checks if they are Korean Standard products, relevant

tests are made and they agree with their specifications. When non-conformance items occur during construction, the team issues Deficiency Notice and Non-conformance Record to keep track of them and then every detail is documented to prevent potential problems in advance.

12. Safety Management

Since the schedule for Home Plus Projects is very tight, there is a high risk of safety accidents. Therefore, thorough safety management is very important. On sites, safety is controlled by detecting risk factors in advance along with regular safety trainings, safety inspection and installation of safety equipment. When a new process starts, the Project Management Team draws up RISK ASSESSMENT MATRIX to figure out risk factors in prior, reviews them and prepares RISK ASSESSMENT REPORT. During site patrol, the Team pays closer attention to activities with high risk factors found by RISK ASSESSMENT and discusses them intensively at safety meetings. The Team also uses SAFETY CHECKLIST for systematic safety control and the safety team from the head office conducts regular safety

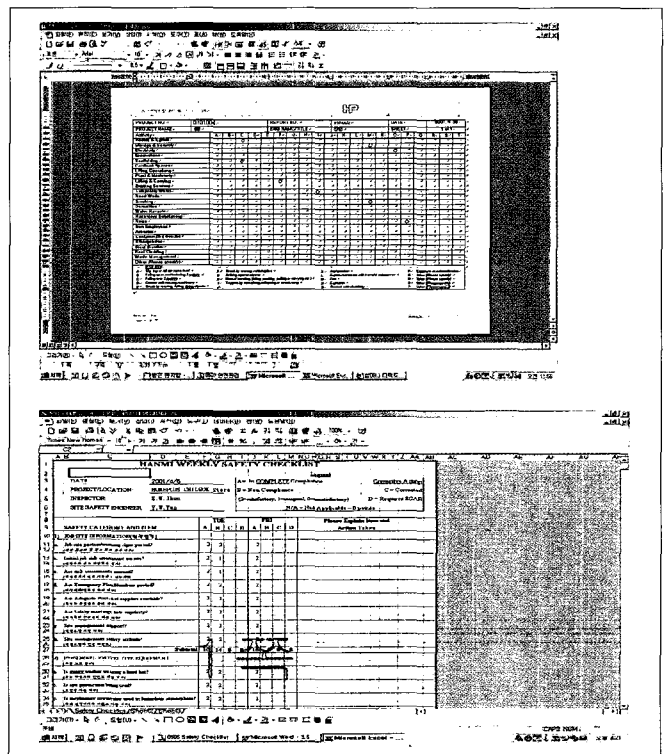


Figure 4. Risk Assessment Report, Safety Check List

auditing to achieve accident-zero projects.

13. Handover

When construction is complete, it is very important to address staged handover strictly and reduce its time in order to move up the opening date. For Home Plus projects, the owner input a new store open team and a store operation and maintenance team as construction nears completion for handover. This caused time to be wasted on coordinating opinions and adjusting different ideas among concerned people and holding repetitive meetings. In order to get rid of these problems and to conduct methodological handover process, the Project Management Team set out handover criteria for the discount store projects. By observing the criteria, the team is controlling the handover smoothly and reducing the time between completion and opening date handling the handover and installation of furnishings simultaneously.

14. Additional Work

The Project Management Team also holds a project review meeting to analyze 'Works Done Well & Improved', 'Works Done Wrong & To be Improved' and

'Construction Check Points & Alternatives' and share them with the Program Management Team so that they can be reflected in next projects.

4. Conclusion

In America CM Firms are expanding their services into project management and program management as they continue to improve their technologies amid clients' demanding more. On the other hand, since CM was introduced 9 years ago in Korea, there are many obstacles to adopt Program Management considering its CM market size, abilities of companies and the way clients view it. However, today's projects are becoming bigger, more complicated and advanced and accordingly, clients ask for more. Therefore, the demand for Program Management is also expected to rise. In particular, PM is being successfully applied for the private Home Plus projects and if it is to be used for the relocation of US forces, it will grow dramatically. In that regard, we hope that Program Management applied for Home Plus projects will be a good example for clients, CM firms and concerned companies who are preparing it.