

The Introduction of the CM applied to the Gwacheon National Science Museum

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I. Project Summary

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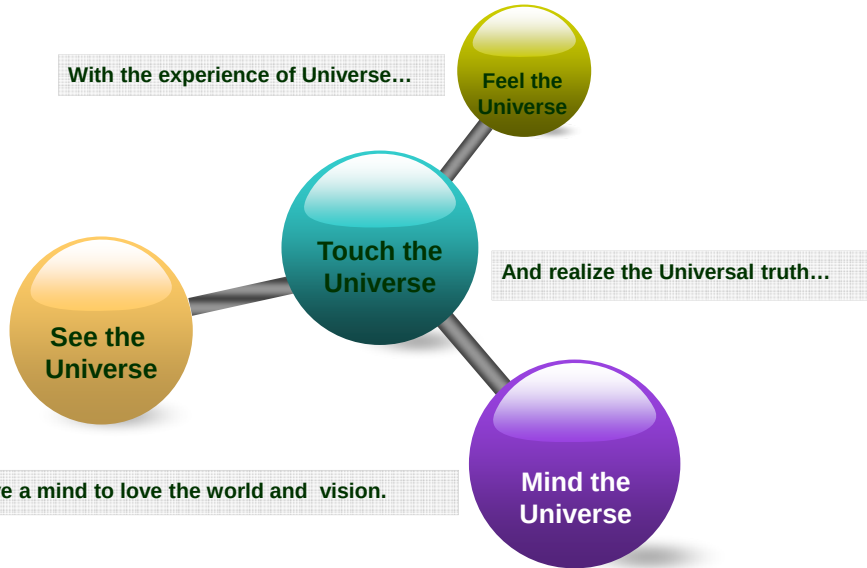
- Project Summary

Project	Gwacheon National Science Museum	Purpose	Culture and Rally (Exhibit)
Customer	Ministry of Education, Science and Technology	Scale	One Basement Three Stories high
Designer	Samwoo, Gonggan	Land Area	165,000㎡
CM	HanmiParsons, GansamPartners	Arch. Area	23,608㎡ / Build to Land Ratio 9.82%
Con - struction	Samsung, Kolong, Daedong	Gross Area	49,168㎡ / Floor Area Realization Ratio 16.66%



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- Design Concept

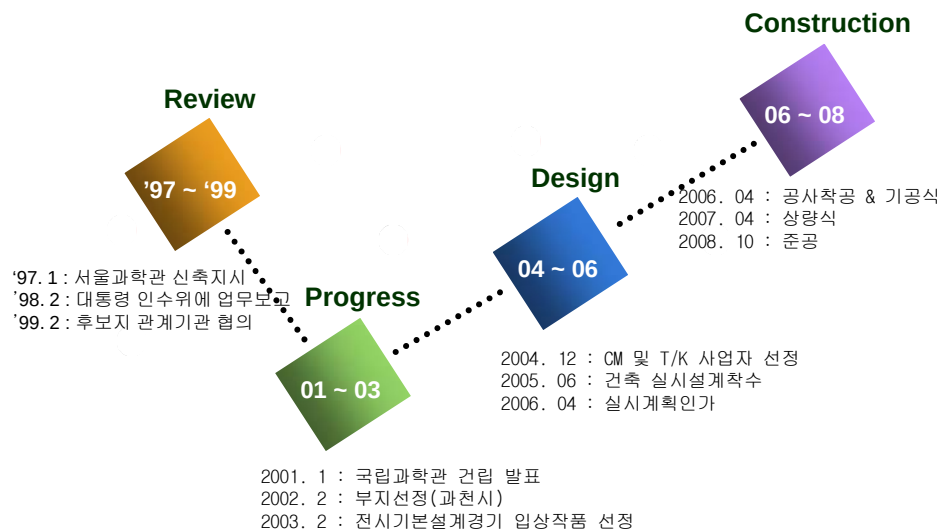


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- Project Progress



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- Site View



- Site View (lay out)



- Site View



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II. CM Performance

- CM Performance Goal
- Schedule
- Cost
- Quality
- Safety

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- CM Performance Goal

Cost Management

- Suggest the goal with cost management
- Construction drawing management
- Monitoring change of design through cost change

Schedule Management

- Make Master Schedule with mild stone
- Support customer decision making
- Control Long Lead Item

Communication

- Keep the good relationship and partnership
- Operate PMIS

- Schedule

◆ Main Plan & Management

Fast Track

- Complete the design before starting Civil work
- Fast Track
- Analyze main issue

Make Progress Management Plan

- Analyze Critical Path
- Zoning Plan
- Resource Leveling

Reduce Duration

- Through Steel Beam Method
- Semi- Unit Type Curtain Wall
- Space Frame for Roof Structure

Expert Schedule Management

- Manage the Interface between works
- Apply Primavera
- Manage 3weeks / 3month Schedule

- Schedule

◆ Schedule Management Tool

Base Line Schedule

- Master Schedule
- Activity Number : 1,095EA(Rev.5)
- Update monthly or weekly

PCS

- Assessment of main issue
- Monthly Update/ Operate with 3Month Schedule

3Week 3Month Schedule

- Make by Contractor
- Reflect the gap between Plan vs. Actual

- Schedule

◆ Duration Reduction

Interior Finish Works are Reduced by 7 month

Original Duration
2006. 4 ~ 2008. 10

Hand Over
2008. 03

CM Coordinator

Civil Works
Fact Track

Perform
Structure &
Finish
Works At
the Same
time

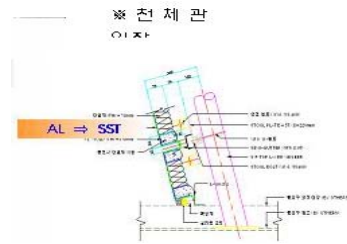
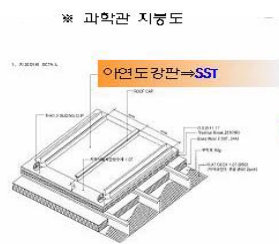
No
Disturbance
with Exhibit
Company

partnership

- Cost

◆ Cost Management

Building Name	Part	Original Finish Material	Changed Finish Material
Science Museum	Roof	Painting Fluor plastic on 0.6 T-Galvanized Steel.	0.5T Stainless Steel 316 DULL FINISH
Planetarium	Wall	2.0T Aluminum	1.5T Stainless Steel 316 DULL FINISH Panel



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- Cost

◆ Cost Reduction

Items for Cost Reduction	Reduction Amount (1,000 won)
Reduce the ESC (2 nd) from Construction Fee	400,000
Reduce Structure Cost	19,500
Cancel the Moving Stage in Theater	204,586
Cancel Web Server	66,770
Delete Air-Conditioner for ELEV. & Mech. Room	9,100
Reduce Retirement Reduction Payment	168,647
Total Amount	868,603

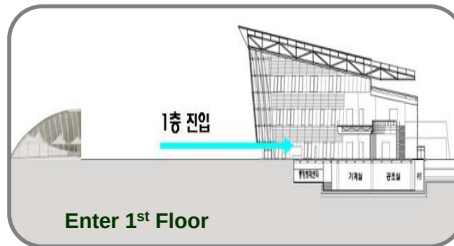
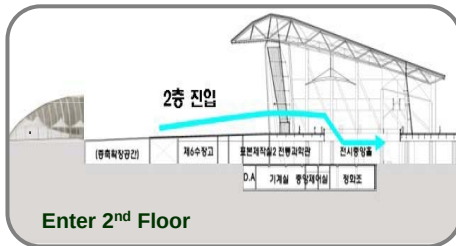
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- Quality

◆ Quality Management in Design Stage



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- Quality

◆ Quality Management in Design Stage



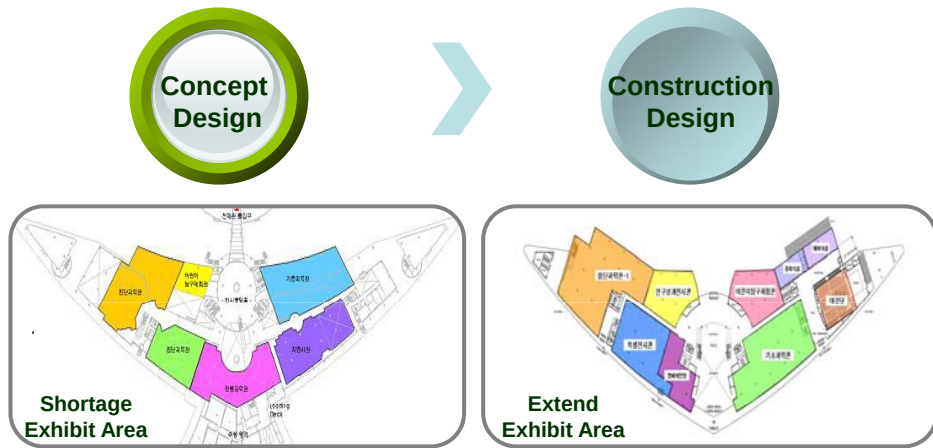
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- Quality

◆ Quality Management in Design Stage



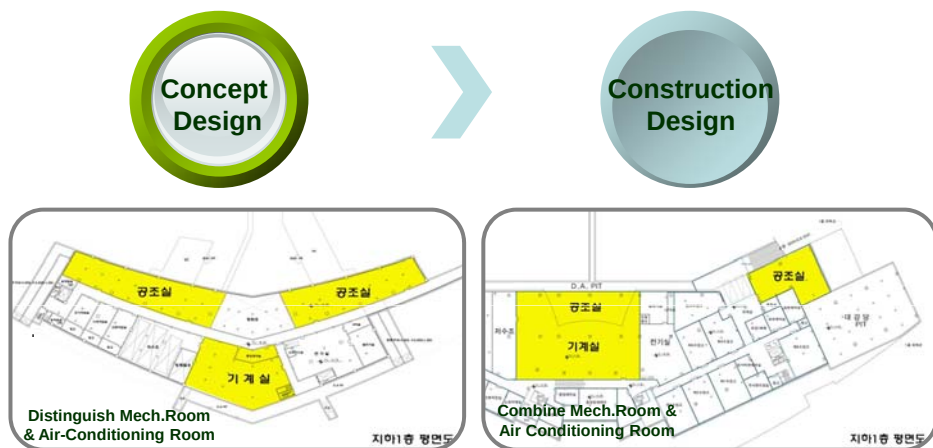
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- Quality

◆ Quality Management in Design Stage



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- Quality

◆ Quality Management in Construction Stage



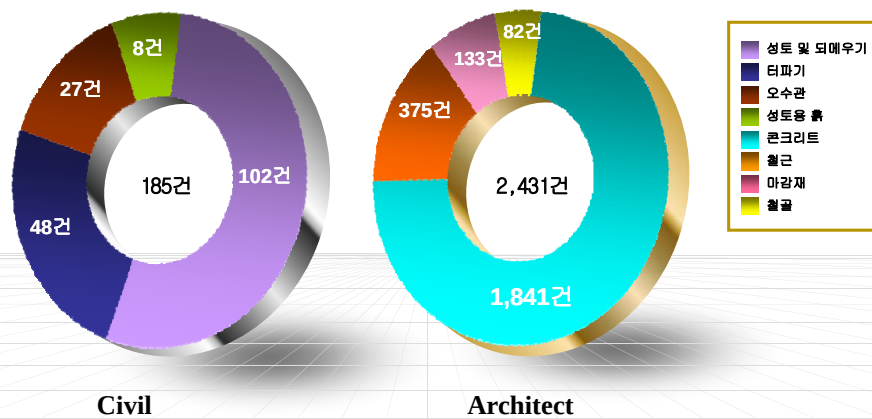
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- Quality

◆ Quality Test



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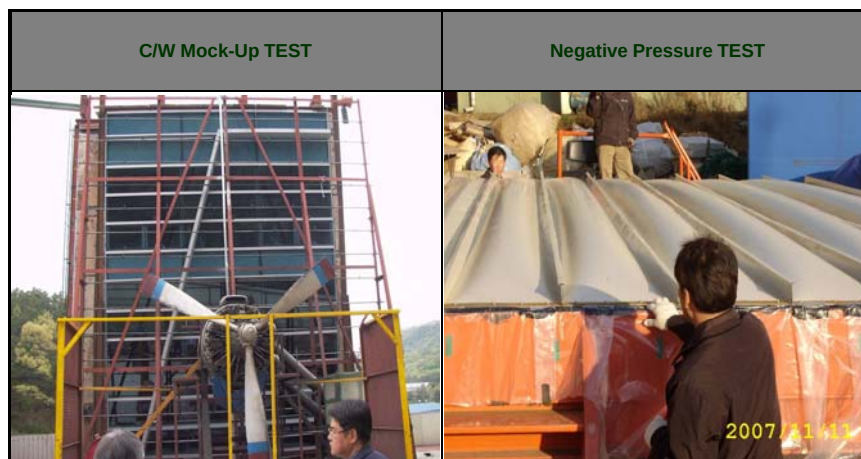
- Quality

◆ Performance of Technology review

Main Works	Arch./Civil/Landscaping	Mech./Fire	Elec./Communication	Total Amount
Design Review	29	12	13	54
Sub-Contract Review	28	7	2	37
Construction Plan Review	28	8	2	38
Shop Dwg. Review	138	117	32	287
Resource (Material) Review	93	44	74	211
Material Acceptance	489	155	331	975
Site Audit	314	298	202	814
Issue Unfit Report (Include DN)	51	2	10	63

- Quality

◆ Main Quality Test



- Safety

◆ No accident Campaign

No Accident = Respecting People

Main Safety Performance

One-day Work Cycle

Safety Training

Self-Audit Safety System

Safety Patrol

HP Safety Performance

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- Safety

◆ Safety Performance

한미파슨스 주간안전점검 체크리스트

WEEKLY SAFETY CHECKLIST SUMMARY			
일/월/년		DATE	2007.10.30
프로젝트		PROJECT	고령교복공단복공사
장소		INSPECTION	고령공단 내 내일
CATEGORY/구분	%	SCORE	REMARKS/비고
1) Job Site Information / 공사 현장 자료			
2) Personnel Protection Equipment / 개인 보호 장비	75		
3) Resurfacing & Installation / 포장 및 설치	90		
4) Electrical / 전기	83		
5) Scaffolding / Elevated Work / 비계 및 고가 작업	-		
6) Ladders & Stairs / 사다리 및 계단	-		
7) Power Tools / Hand Tools / 전동 및 수동 기구	100		
8) Fire Protection / 소방			
9) Mobile Equipment / 이동 기구	100		
10) Excavation and Confined Space / 파쇄기 및 밀폐 공간	100		
11) Walking and Working / 통행 및 작업	83		
Total	88		
SAFETY CORRECTIVE ACTION REQUESTS / 안전 시정 조치 요청서			
요구된 SCAR 요청된 항목	OPENED THIS WEEK 공유 발행 건수	OPENED TO DATE 누계 발행 건수	CLOSED THIS WEEK 공유 마감 건수
현장 안전율 %	88		

일일 시공 사이클활동 안전감시단 활동 사항



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- Safety

◆ No Accident Report and Certification

No Accident Report	Certification
- No Accident Campaign Beginning Report => To KOSHA on June 1. 2006 - Achievement day for No Accident => August 29. 2008 - Total Period for No Accident => 1,450,000 hr.	

III. Extra Significant Issue

- Applied Special Construction Method
- CS (Customer Satisfaction)
- Suggestion of Improvement items

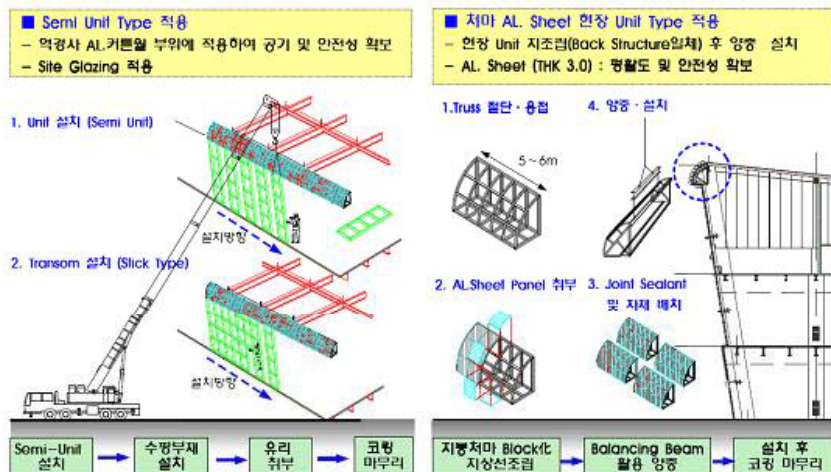
- Applied Special Cont. Method

◆ Cable Truss Method

Method	Photo
● Center Hall Height : 33.3m ● Many Problems in Original Method ● Assemble the Truss partially in a factory and install on site. It means Block Method.	

- Applied Special Cont. Method

◆ Curtain Wall Semi - Unit



- Applied Special Cont. Method

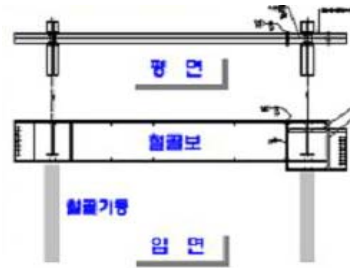
◆ Long Span Structure

공법
설명

기둥과 기둥의 거리가 먼(당 현장은 14.7m) 구조형식을 장 스팬이라 하고 주로 박물관, 전시관 등 공간 활용도가 많은 건물에 적용됨. 당 현장은 기둥은 RC조로 하고(철골기둥은 보 철골 조립용임) 보는 장 SPAN에 유리한 철골을 적용하였음.

공법
적용
사진

- 조립용 철골기둥을 관통하는 철골보 구조형식



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- Customer Satisfaction

◆ CS by the understanding customer need



- Minimize Design Change
- Obey the Business Duration
- Perform Project Meeting with Exhibit Company
- No Safety Accident

- Cut the ESC (2nd)
- No Disturbance between Cooperators
- Perform Project Meeting with Exhibit Company
- No Safety Accident

- 100% CS
- Receive Customer Citation

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- Customer Satisfaction

◆ HANMIPARSONS Site Client Satisfaction Program

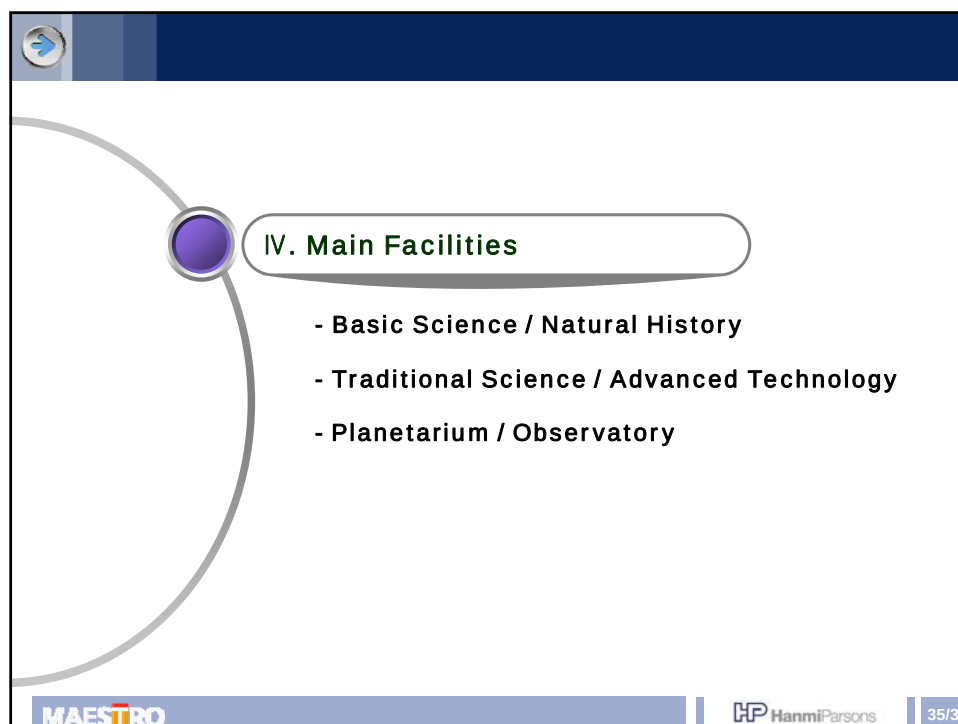
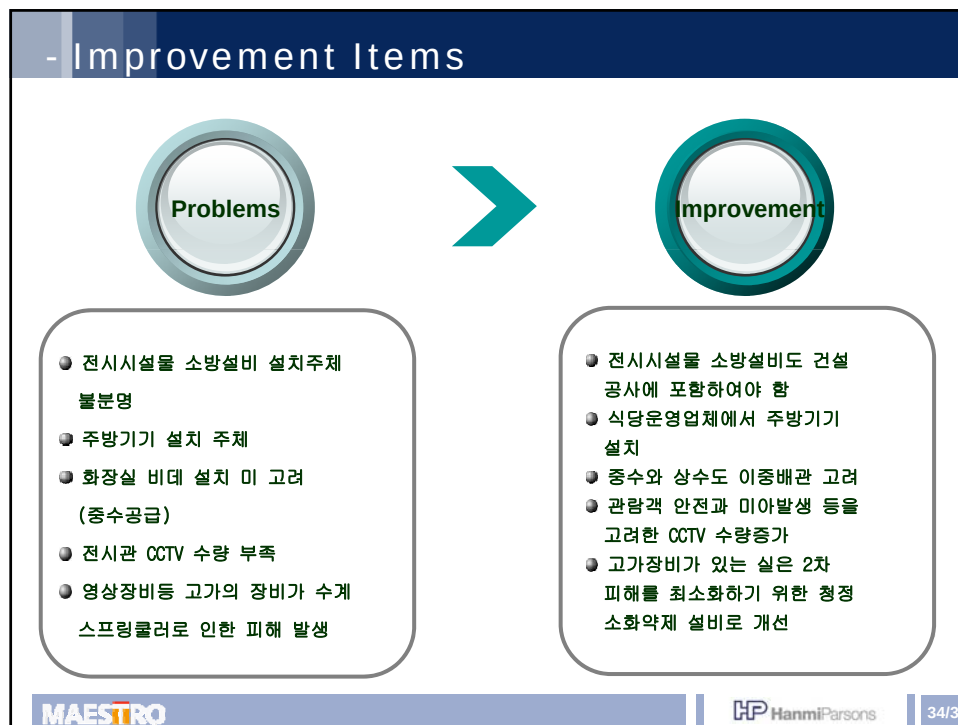
Customer Success KPI	Executive Plan	Ratio(%)
공사비 증가 억제	설계검토 철저 및 VE 정례화	30
참여사간 Interface 해소를 위한 Coordinator 역할 철저	PMIS 운영철저 및 시공사간 Communication 지원	20
고품질 명품 과학관 건립을 위한 KOM 실시	주요 공종 시공 전 시공발표회 실시	20
무재해 달성	전 직원 주간 안전 Patrol 실시	30

- Improvement Items



- 건설공사와 전시시설물 CM 분리 발주
- 전시시설물업체 가설공사비누락
- ~을 고려한다. ~할 수 있다. 등 애매한 표현
- 건설폐기물을 발주처에서 처리한다는 계약조건 때문에 폐기물 처리비 증가
- 전시시설물 보호를 위한 자외선 차단 문제

- 전시시설물 사업관리는 건설공사 CM에 포함하여 발주(대구, 광주 과학관)
- 전시시설물 공사 발주 시 가설공사비 등을 원가에 포함
- 구체적이고 명확한 표현 필요 (~을 시공한다. 클레임 방지)
- 시공 중 발생하는 폐기물은 시공사에서 직접 처리할 수 있도록 명문화 필요
- 최악의 조건을 고려하여 설계시 반영



- Basic Science / Natural History

Basic Science	Natural History
 - The Korea Greatest Artificial Lightning / Earth quake experience system - Typhoon Simulation Experience	 - First Experience System of Earth Environment Change in real time in Korea - Experience ecology of the Korean Peninsular

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- Traditional Science / Advanced Tech.

Traditional Sciences	Advanced Technology
 - Traditional science through historical relics - Observation of celestial bodies and solar watch	 - Ubiquitous future society Tour of life sciences, such as embryo replication - Future technologies to build the foundations for national growth

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- Planetarium / Observatory

Planetarium



- Biggest Size / Universe experiential learning space
- Reproduction of the night's sky on a dome
- The world of science in a 3D video

Observatory



- Optical / Radio / Solar Telescope
- Observation Constellation

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Thanks