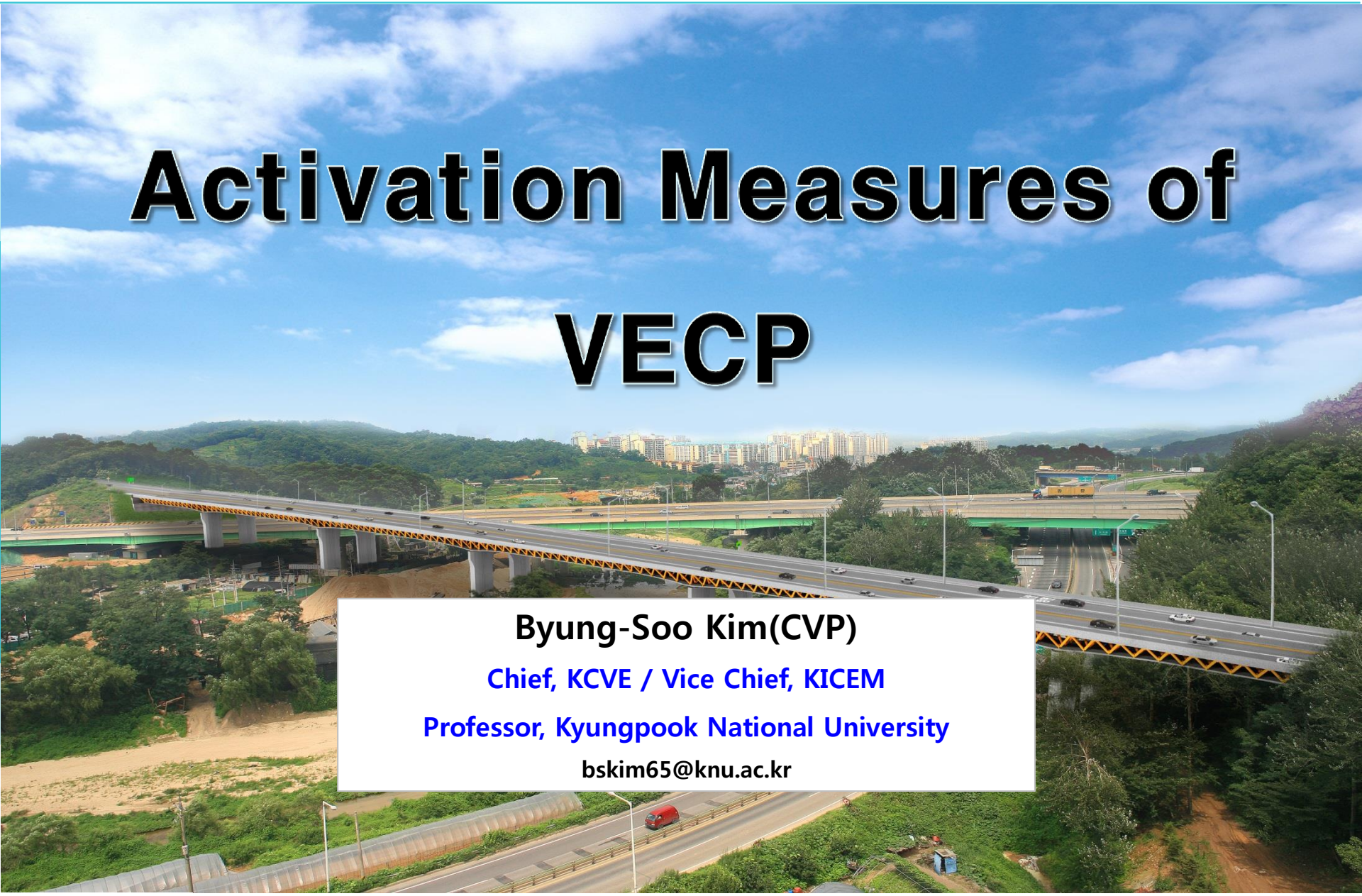

# Activation Measures of VECP

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# CONTENTS



# The Issue - Cost Saving!

## 국토부, VE확산 주력... 년간 공사비 1조1천억 예산 절감

12월 1일 '2016 전국 VE 경진대회' 개최… VE 활성화 일익

하종숙 기자 | hjs@ikld.kr

승인 2016.11.30 14:

고덕강일지구·과천주암 기업형

국토부-산하기관, 10년간 VE 8

[국토일보 하종숙 기자] 올 가치

기업형 임대주택 공급촉진지구 조

공사 기본설계'가 공동으로 최우수

국토교통부는 12월 1일 한국토지

E) 경진대회' 시상식을 개최하고 토

가치공학이란 건설공사의 설계와

비용은 낮추는(↓) 대안을 만드는

을 위해 VE 확대에 적극 나서고 있

## 철도공단, VE로 올해 872억원 규모 예산 절감

사내 경진대회 통해 4개분야 우수

한국철도시설공단은 25일 설계 및

했다고 밝혔다.

VE(Value Engineering, 가치혁신

을 확보하기 위해 여러 분야 전문가

토해 대안을 창출하는 기법을 말한

철도공단은 이와 관련 최근 사내 VE

선정, 그 성과를 공유했다고 덧붙였

## 대구시, 공사설계 경제성검토 예산절감 194억원

등록 2017-01-19 10:52:16

【대구=뉴시스】정창오 기자 = 대구시는 지난

로·건축·하수·하천분야 등 공공건설공사의 설

제성검토(설계VE-Value Engineering)를 통해

원의 예산을 절감하고 창의적 아이디어 166

반영해 공공시설물의 가치를 크게 향상시킨

로 나타났다.

## 경기도시공사, '설계VE'로 공사비 122억원 절감

배성주기자 | mintbae@naver.com 2017.02.28 01:22:29

[천지일보 경기=배성주 기자] 경기도시공사가 지난해 '설계VE(Value Engineering)'를 통해 122억원의 공사비를 절감했다고 27일 밝혔다.


설계VE는 100억원 이상 건설공사의 기본 및 실시설계 단계 등에서 경제성과 현장적용 타당성을 기능·대안별로 검토해 애초 계획안보다 품질과 성능은 높이고 비용은 낮추는 대안을 만드는 기법이다.

보통 기본설계, 실시설계 및 설계변경 단계에서 각 1회 이상 진행한다.

도시공사는 지난해 건설공사 관련 단지조성과 공공건축물 분야를 대상으로 설계VE를 진행한 결과 시공비용 2252억원(10건) 중 122억원(5.4%)의 예산을 절감했다. 공사비를 포함해 초기비용부터 유지관리까지의 모든 비용을 합하면 총 153억원이 절감될 것으로 예상했다.

**Only VEP?**

# 1. Definition of VECP

Federal Acquisition Regulation(**FAR**) 52.248-1 Value Engineering.

"Value Engineering Change Proposal (**VECP**)" means a proposal that—
(1) Requires a change to this, the instant contract, to implement; and
(2) Results in **reducing** the overall projected **cost** to the agency without impairing essential functions or characteristics;

provided, that it does not involve a change—
(i) In deliverable end item quantities only;
(ii) In research and development (R&D) end items or R&D test quantities that is due solely to results of previous testing under this contract; or
(iii) To the contract type only.
If a VECP is accepted, the Contractor shall **share** in net acquisition savings according to the percentages shown in the table below.

# Regulations for Domestic VECP

1. Technology Development Compensation Regulations
2. Budget Provisions
3. VECP Regulation

## VECP Regulation

Enforcement Decree of the Construction Technology Promotion Act

**Article 75(VE Review)**

2. If the design is changed by 10 percent or more of the total construction cost or the construction cost per construction during the construction of the construction work with the total construction cost of 10 billion won or more (except for the increase due to simple increase in quantity or price change).

| TDCR | Contents |
|---|---|
| Enforcement Decree of National Contract Article 65 | ▪ Contracting parties may submit cost reductions and Schedule shortening schemes through new technologies and processes.<br>▪ 70% of the savings from the proposal can be paid to the contractor. |
| General Contract of Construction Contract Article 19 | ▪ The contracting parties may request a change of design when cost reduction and shortening of the effect of the new technology and construction method (including technology, construction method and equipments with equivalent function or effect equivalent to the design of the ordering organization) are significant. |
| Regulations for Operation of Technology Promotion Article 2~10 | ▪ It is necessary to submit pros and cons before and after improvement, structural stability review, detailed construction plan, quality and safety management plan, detailed cost statement, and other relevant data.<br>▪ The approval period should be decided within 30 days after receipt. The deliberation period can be extended within 15 days if necessary. |

| Budget Provisions | Contents |
|---|---|
| National Finance Act Article 49 | ▪ The head of each central office can pay a portion of the reduced budget for the increase in revenue from the method of budget execution or system improvement and budget reduction, as an incentive to those who contribute to it, and use the saved budget for other projects.<br>▪ In the case of payment of the incentive and deduction of the amount of savings, it should be reviewed by the budget reward review committee. |
| Budget Provisions Presidential Decree Article 25751 | ▪ If you save on major business expenses, 10 percent of your savings<br>▪ Regulations on the subject of budget payment, size and payment<br>▪ Function and composition of the budget reward review committee<br>▪ Procedures and related tasks of budget reward review |

# Performance/Status of VECP Related System

## Technology Development Compensation Regulations

- 7 results for 26 years, total savings of 11.8 billion won
- Inadequate regulations on timing and method of compensation, Long-term processing procedures, inadequate recognition by the clients and contractors

Yearly Performance (1992-2014)

| Year | Project | Contractor | Reduction (Won) |
|---|---|---|---|
| 1992 | Juam Dam metropolitan waterworks | Dona Const. | 0.29 Billion |
| 1992 | Busan Second Urban Expressway | Daelim Const. | 0.06 Billion |
| 1995 | Jinju Nabul River Construction | Taeyoung Const. | 0.525 Billion |
| 1996 | Yulchon Industrial Complex Landfill Construction | Hyeondai Const. | 10 Billion |
| 1998 | Anyang Gymnasium roof steel frame truss construction in Anyang City | Doosan Const. | 0.9 Billion |
| 2012 | Changzhou Youngdeok Expressway | Kolon Const. | 0.5Billion |
| 2014 | Sansung Tunnel Interchange | Daelim Const. | 1.1 Billion |

## Budget Provisions

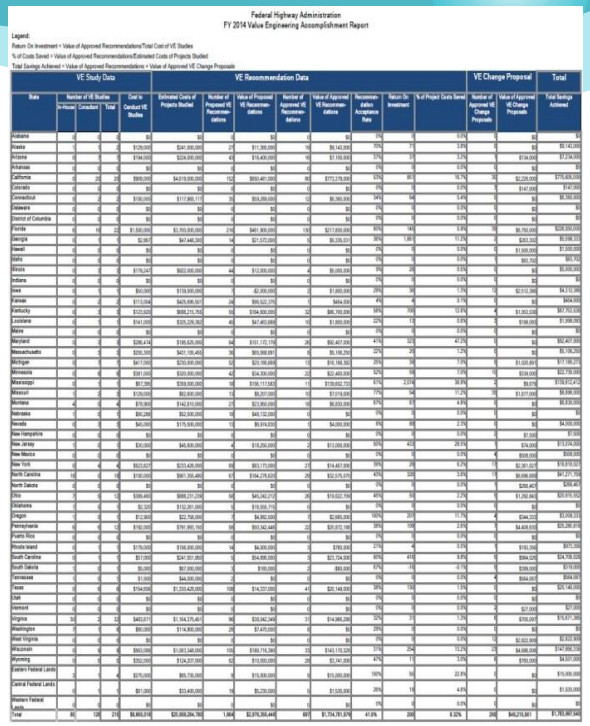
- Saving about 1.2 trillion won in 17 years and increasing the income of 10.4 trillion won
- Focus on increasing income rather than budget saving, focusing on specific ministries

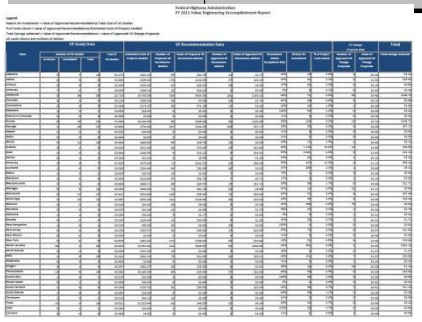
Yearly Performance(1998-2014)

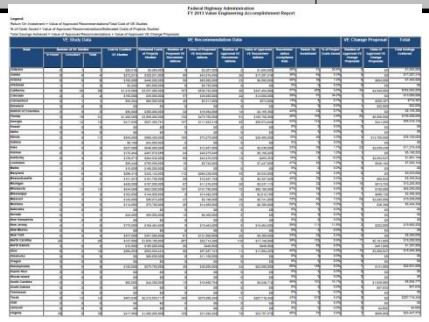
| Year | No. | Financial improvement effect (0.1 Billion Won) | | | Incentive Payments (Million Won) |
|---|---|---|---|---|---|
| | | Sum | Reduction | Amount of increase in income | |
| 1998 | 12 | 127 | 127 | - | 4,256 |
| 1999 | 282 | 18,488 | 528 | 17,960 | 11,000 |
| 2000 | 305 | 14,171 | 225 | 13,946 | 7,423 |
| 2001 | 115 | 10,301 | 339 | 9,962 | 2,211 |
| 2002 | 105 | 5,208 | 524 | 4,684 | 2,003 |
| 2003 | 119 | 10,968 | 610 | 10,358 | 1,758 |
| 2004 | 152 | 18,883 | 2,923 | 15,960 | 1,814 |
| 2005 | 220 | 14,856 | 2,035 | 12,821 | 1,912 |
| 2006 | 152 | 15,556 | 3,497 | 12,059 | 719 |
| 2014 | 59 | 7,948 | 1,364 | 6,584 | 241 |
| 계 | 1,521 | 116,506 | 12,172 | 104,334 | 33,337 |

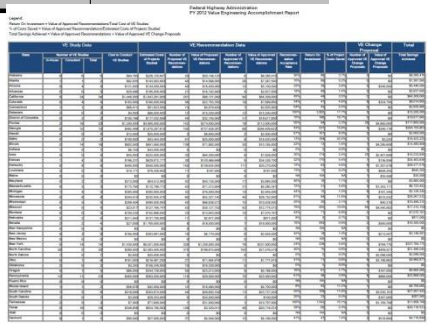
# 2.Why VECP ?

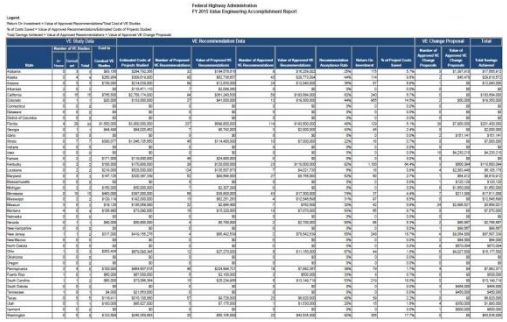
| Year | Federal Highway Administration (FHWA) | | % of Project Costs Saved | Return On Investment (ROI) |
|---|---|---|---|---|
| | Number of VECP | Saving by VECP (million dollar) | | |
| 2011 | 341 | 38.33 | 3.12 | 80 |
| 2012 | 313 | 41.92 | 3.78 | 96 |
| 2013 | 286 | 51.37 | 5.01 | 118 |
| 2014 | 269 | 49.22 | 8.32 | 200 |
| 2015 | 178 | 39.97 | 5.90 | 129 |
| **Average** | **277.4** | **44.16** | **5.23** | **124.6** |











# Why VECP ?


From White House's Office of Management and Budget (OMB) VE as one of the most important government budget cuts.

The US Department of Defense, which was the first US agency to operate the VE system, has made extensive use of the VE Manual as well as a comprehensive VE manual for services, organizational processes, products and facilities.

**Federal Highway Administration**

U.S. Department of Transportation
**Federal Highway Administration**
Federal Highway Administration logo

**Bureau of Reclamation**

U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION

| Agency overview | |
|---|---|
| Formed | 1902 |
| Type | Office |
| Headquarters | Washington, D.C. |
| Employees | 5,425[1] |

# Executability of contractor ?

| Bidding type | n | Working budget ratio | | | |
|---|---|---|---|---|---|
| | | Average (Ave.) | Minimum (Min.) | Maximum (Max.) | Standard deviation (S.D.) |
| L/C | 513 | 104.8% | 78.9% | 141.9% | 8.6% |
| Alt. | 7 | 96.2% | 88.3% | 114.0% | 8.8% |
| T/K | 58 | 93.0% | 76.1% | 128.0% | 8.1% |
| Qual. | 29 | 87.4% | 70.0% | 99.4% | 7.9% |
| P/C | 7 | 82.7% | 69.6% | 91.5% | 7.5% |
| total | 614 | 102.5% | 69.6% | 141.9% | 10.0% |

| Working budget ratio | n | Proportion |
|---|---|---|
| 70% more ~80% less | 1 | 0.2% |
| 80% more~90% less | 15 | 2.9% |
| 90% more~100% less | 145 | 28.3% |
| 100% more~110% less | 229 | 44.6% |
| 110% more~120% less | 101 | 19.7% |
| 120% more~130% less | 18 | 3.5% |
| 130% more~140% less | 3 | 0.6% |
| 140% more~150% less | 1 | 0.2% |
| Total | 513 | 100.0% |

Worse execution rate of contractors

**Cause : Lowest Bid Price & Performance Cost System**

| Year | Historical data | | Working budget ratio | | | |
|---|---|---|---|---|---|---|
| | n | proportion | Ave. | Min. | Max. | S.D. |
| before 2005 | 10 | 1.9% | 101.2% | 87.4% | 120.0% | 11.3% |
| 2006 | 4 | 0.8% | 98.3% | 90.1% | 104.9% | 6.1% |
| 2007 | 60 | 11.7% | 105.2% | 86.2% | 116.9% | 5.9% |
| 2008 | 127 | 24.8% | 108.4% | 80.4% | 135.8% | 7.8% |
| 2009 | 161 | 31.4% | 102.8% | 78.9% | 139.3% | 9.8% |
| 2010 | 75 | 14.6% | 103.9% | 92.1% | 123.1% | 7.8% |
| 2011 | 76 | 14.8% | 104.3% | 91.3% | 141.9% | 7.4% |
| total | 513 | 100.0% | 104.8% | 78.9% | 141.9% | 8.6% |

**KSCE Journal of Civil Engineering (2017) 21(5):1587-1594**
"Study on the Issues of the Lowest Bidding through the Analysis of Working Budget Ratio of Korean Construction Companies"

# 3.Questions Surrounding VECP?

- Must share savings?
- Tolerance contractor?
- Use for cost reduction of contractor?

# 4.VECP in USA

## VE Object

**FAR 52.248 : more than $0.1 million project**

**FHWA 23 CFR Part 627 : more than $25 million project**

→ No federal grants will be paid if VE is not implemented in the project.

## VE Review Time

**Design Progress 30%(Basic Design Complete) : Mandatory in Washington, California, Virginia State**

**Design Progress 10% (Planning Phase) Possible**

**Construction Phase : Mandatory in FHWA**

# 4.VECP in USA

## Federal Acquisition Regulation(FAR 52.248)

**Architect Engineer VE – VE Proposal(VEP)**

**Construction VE – VE Change Proposal(VECP)**

**VEP** : Means a VE proposal submitted by an employee of a person who has undertaken the VE or an employee of a government agency for any project plan or design by contract with a government agency. It is made before construction contract and does not accompanied modification of construction contract.

It is carried out when the design is 35% progressed.

**VECP** : Alternative proposals for contractors to request changes to the project plan, design or specification specified in the contract for cost reduction.

**Share Saving**

# 4.미국의 VECP 제도

## FAR 52.248_VECP

### Share Saving

| Contract Type | | Share Rate (%) | | | | | |
|---|---|---|---|---|---|---|---|
| | | Construction Cost Saving | | | Maintenance Cost Saving*** | | |
| | | GSA | DOD | UDOT | GSA | DOD | UDOT |
| DBB | Sum | 55 | 55 | 50 | 20 | 20 | 20 |
| | Actual Cost Settlement | 25 | 25 | — | 20 | 20 | 20 |

DBB : Design Bid Build
GSA : General Services Administration
DOD : Department of Defense
UDOT : Utah Department of Transportation

# 5. Factors that Inhibit the Activation of Domestic VECP

| Problems and Issues | |
|---|---|
| Contractor | PQ Unpaid additions, non-payment of appropriate incentives, non-compensation for maintenance cost savings, rejection due to reduced sales, unfairness, protection of ideas (ideas) |
| **Client** | Design rejection (fear of audit, punishment), lack of compensation system for performance, construction VE related claim, lack of education and understanding |
| Designer | Rejection due to additional work burden (cost increase risk) |
| Subcontractor | Insufficient compensation system |
| Common | Unclear contract amount adjustment standards, lack of review approval standard procedures, necessity of mandatory regulations, appropriate distribution of risks, delays and administrative waste due to excessive processing periods, uncertain timing of distribution of profit distribution, lack of construction VE manual, inadequacy of construction VE law system |

# 6.Improvements of VECP

## Amendments to VECP legislation

- **Enforcement Decree of National Contract Article 65**

**(Adjustment of contract amount due to design change)**

**(As Is)** By using new technology and construction method, it is recognized that the effect of reduction of construction cost and shortening of construction period is remarkable…

**(To Be)** By using alternatives that have function more than the equivalent level of original design and cost reduction at the construction phase after the construction contract …

# 6.Improvements of VECP

Enforcement Decree of the Construction Technology Promotion Act Article **75 VECP Object**

| As Is | To Be |
|---|---|
| Enforcement Decree of the Construction Technology Promotion Act<br>Article 75(Design VE) | Enforcement Decree of the Construction Technology Promotion Act<br>Article 75(Design VE)<br><br><New><br>3. If the Contracting Authority is deemed to be effective in reducing the construction cost and shortening the construction period in the construction phase, the Contractor shall instruct the contractor to carry out the construction VE. |

# 6.Improvements of VECP

## Amendments to VECP legislation

| As Is | To Be |
|---|---|
| **(Contract SOP) General Condition of Construction Contract**<br>Article 19 (Design Change) | **(Contract SOP) General Condition of Construction Contract**<br>Article 19 (Design Change)<br>**<New>**<br>**5.** When there is a need to change the design through construction VE |
| Article 19-4(Design change by new technology and new method) | Article 19-4(Design change by new technology and new method)<br>**<New>**<br>**Article 19-4-1(Design Change by Construction VE)** ①If The contract partner is considered to be effective in reducing the construction cost and shortening the construction period by using the alternative design which shows the function equal to or higher than that of the original design in the construction phase and the cost is reduced.<br>A design change may be requested in writing to the contracting officer via the construction supervisor. |

# 6.시공VE 제도 개선방안

## Amendments to VECP legislation

| As Is | To Be |
|---|---|
| **Design VE Guideline** | **Design VE and Construction VE Guideline** |
| Article 48(Object) | 제48조(Object)<br><br>**<New>**<br>**② Construction VE object is follow.**<br>1. Construction phase of construction work with total construction cost of over 30 billion won(Excluding design build and alternative bidding work, technology proposal bidding work, private investment business, and design competition business)<br>**2.** Construction that can reduce construction cost by applying new technology and construction method in construction phase<br>3. Construction work that develops and applies alternatives that have functions equal to or higher than the original level and cost reduction in the construction phase<br>4. In addition, A construction work that the Client considers to require construction VE at the construction stage |

# Thank you