

*Invited Presentation 1*

## **Presentation of the Hellenic Construction Economics Institute**

### **Hellenic Construction Economics Institute**

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### **Abstract**

The Hellenic Construction Economics Institute (C.E.I.) has been active, since its establishment in 1998, in the research and analysis of topics related to construction projects and construction sector. C.E.I. is a self-ruling, non-profit organization, supervised by the Ministry for the Environment, Physical Planning, and Public Works (MEPPPW). The Institute's task is to bring forth issues concerning the Construction Sector so that not only MEPPPW and other pertinent authorities initiate administrative and legal procedures for the continuous development and improvement of the framework for the implementation of construction projects but also productive constitutions to be supported in their tasks. This presentation is indented in providing an outline of the most significant of CEI's activities and the conclusions derived thereof.

### **Keywords**

Construction Cost Estimation, Pay Items for Construction Works, Technical Specifications, Construction Statistics, Public Private Partnerships

### **1. Introduction (Aim – Administration – Resources)**

The mission of the Hellenic Construction Economics Institute is the research and analysis of topics related to the design, cost estimation, productivity, quality, funding and award procedures of Public Sector as well as Private Sector Construction Projects. As a matter of fact, C.E.I.'s subjects encompass the majority of issues concerning the construction sector.

The research and study of the above subjects requires the participation of experts from all sectors related to construction: designers, contractors, economists, ministry officials, university researchers.

C.E.I. is providing consultancy services in the foresaid fields since it was established in 1998. By statute the Institute is a non-profit organization, supervised by MEPPPW but maintaining administrative independence. It is governed by a five party board of directors, of which the president and vice president are appointed by the Minister of EPPPW and the rest three members are recommended by the Technical Chamber of Greece, the Association of Greek Industry and the Contractor's Unions. C.E.I.'s permanent staffing consists of Economists and Engineers, acting as a liaison with a broad variety of external collaborators -highly qualified scientists and engineers- called upon as members of work groups according each individual project requirements.

### **2. C.E.I.'s Work Short Presentation.**

C.E.I.'s work consist in two major categories:

- *Studies – Researches – Projects.*
- *Scientific and Technical Support Services.*

In addition, C.E.I. has created *Library* and *Data Bank* continuously updated and has organized Conferences: *National Specifications for Public Works* (18/07/2001), *Private Construction Legal Frame – Construction Contractors Registry* (25/4/2002), *Construction Sector Business Environment after the completion of the Athens Olympic Games of 2004* (7/7/2004).

1.

## **2.1 Studies – Researches – Projects**

### **2.1.1 According to C.E.I. annual planning**

#### *- Public and private construction activity – progress up to 2004 (02/2002)*

Primary subjects of the research are the size of the domestic construction sector and its participation to macroeconomic figures, while the prospects of the above figures are examined with respect to the progress that has been achieved for the projects of CFS III and 2004 Olympic Games.

#### *- Aggregates in the region of Attica (05/2002)*

Main subjects of the research are the size of supply and demand for aggregates, the analysis of the production cost, the transportation cost of aggregates, the examination of the legal framework that regulates the operation of quarries, the quality of aggregates, as well as the environmental impacts from the operation of quarries in Attica. A major part of the research refers to the prospects of the above figures and matters under the angle of the simultaneous progress of the CFS III and 2004 Olympic Games projects, which is expected to lead in increased demand for aggregates in Attica during the period 2002-2004.

#### *- Concentration of the construction sector considering complete operation of the new legal framework (L. 2940/01) (07/2002)*

Main subject of the research is the impact on the structure of the domestic construction sector as well as on its concentration from the application of the L.2940/2001, which motivates merges and acquisitions between construction firms. In parallel, the impacts of the new legal framework on the future supply and demand in the construction sector are examined considering the progress of the CFS III and 2004 Olympic Games projects.

#### *- Evolution and recent trends in the domestic private construction activity (11/2002)*

Main subject of the research is the analysis of the basic characteristics of the domestic private construction activity, by the available statistical data of National Statistical Service of Greece.

#### *- Public and private construction activity – Estimates up to 2006 (02/2004)*

Primary subjects of the research are the size of the domestic construction sector and its share to macroeconomic figures of the country, while in parallel the prospects of the above figures are examined on the axis of completion of 2004 Olympic games project and the progress of CFS III construction projects.

2.

#### *- Financial structure of the construction companies – Diachronic and stratified analysis (02/2004)*

The subject of this study is the impact of mergers on the financial structure of 231 major construction companies.

#### *- Size and basic characteristics of construction sector manpower (03/2004)*

Main subjects of the research are the size of construction sector manpower, its share on the total employment of Greek economy and the basic employment characteristics of this sector. Moreover, the prospects of the employment size are examined on the axis of completion of the Olympic games projects and the progress of the CFS III construction projects.

#### *- Concise presentation of the construction sector in the European Union & extroversion. The case of Greece (07/2004).*

Main subjects of the study are the basic figures and characteristics of the European construction industry, examined as a total as well as per participator country in the European Union, and the recent evolutions in the construction sector for every country – member of EU. Moreover, various important matters are examined, such as the size and the progress of construction sector's extroversion for EU countries as well as the strategies of the major construction companies for expansion in the international market, strategies that can determine a specific development framework for the Greek, also, companies.

*-Form, structure and future exploitation of human resources in the domestic construction sector (12/2004)*

The scope of the study is to suggest applicable treatment policies for the redundant labour supply that has begun to appear with the completion of the Olympic construction projects and the significant delay in the realisation of CFS III projects. Main subjects of the study are the evolution of construction sector's macroeconomic figures, the evolution of total employment, the quantitative and qualitative characteristics per speciality (university engineers, graduates of technical education institutions, administrative staff, workmen), as well as the educational necessities per speciality aiming at the emergence of those skills and knowledge that are required by the market. In the study is attempted an estimation of the medium-term prospects of the construction sector while their expected influence on the number of employees and the composition of specialities is explored.

3.

*- Construction projects implementation based on PPP principles (03/2005)*

CEI's study focuses in construction business environment implications and sector's correspondence to the emerging PPP legal framework. Topics analysed include PPP methodologies, risk analysis assessment and allocation, obligations of the counterparts, the role of funding institutions, listing of project categories apt to be promoted with PPPs, as well as estimations for the demand of projects suitable to proceed with PPPs. EU policies on PPPs are also discussed and is attempted an initial estimation of the effects thereof to the domestic construction business. Finally CEI suggests policies and regulations for the smooth adaptation of PPP procedures by the Greek contractor firms.

*- Methodology and procedures for small-medium scale projects PPPs (Under construction)*

The scope of this report is the analysis of the procedures for the implementation of small-medium scale projects of various characteristic categories with increased demand. Discrete analysis is performed on issues concerning pre-bid procedures and implementation, namely: feasibility studies, social acceptance of project, preliminary matters, environmental assessment, permission granting procedures, financial /economic matters, contract award procedures and contract administration and project owner's technical support requirements. This report is intended as a guideline to parties interested in small-medium scale PPPs, as local authorities and contractors.

4.

#### **2.1.2 Reports/studies of CEI for the MEPPPW**

- *Comparative analysis of construction contracts awarded in the periods 1994-1998 and 1998-2001. Implications of the application of "mathematical method" for the appointment of low bidder.*
- *Assessment on cost and quality of design of construction projects co-funded by EC through CSF I and CSF II.*
- *Assessment of contractor firms profitability for the period 1996-2000*
- *Evaluation of the MEPPPW's quality structural interventions*
- *Assessment of CSF I and CSF II co-funded projects cost (periods 1989-1993 and 1994-2000)*
- *Athens metro construction cost analysis*
- *Egnatia highway tunnels cost analysis*

5.

#### **2.1.3 Reports/studies conducted for Public Sector Authorities**

- *Adequacy of construction sector human resources potential (12/2000)*

Assessment prepared for MEPPPW and Athens 2004 Organization on the scope of estimating the adequacy of locally available skilled and unskilled labor for the timely completion of 2004 Olympic games infrastructure.

*- Compilation of draft technical specifications for building works (2003)*

This project was funded by the School Buildings Organization.

## **6.**

### **2.1.4 Reports/studies prepared for Private Sector**

*- Assessment for human resources of the construction sector.*

The assessment was performed on behalf of H Class Contractor's Companies and focuses on specialties and skill level distribution, availability and adequacy of most required skills. There are also included proposals for measures to be taken to better adjust the existing potential to construction sector needs and requirements.

### **2.2. Scientific and Technical Support Services to the MEPPPW**

*- Projects awarded to CEI in the framework of MEPPPW's Action Plan for the modernization and improvement of construction projects implementation processes.*

*a) Elaboration of a comprehensive list of technical specifications, intended to constitute the basis of Standard National Technical Specifications.*

Utilizing documents applied in recent major construction contracts as start-up text, a new series of up-to-date specifications was developed, with uniform structure and systematic reference to European Standards applicable to incorporated materials and testing procedures.

The new documents contain the following main chapters:

1. Work description – definitions.
2. Acceptance criteria for incorporated materials
3. Works execution methodology – requirements for completed work
4. Quality control requirements for completed work acceptance
5. Work specific requirements for health, safety and environmental protection
6. Method of measurement.

440 titles were delivered in total, covering the majority of construction items. More than a hundred highly experienced engineers worked for 2 years to accomplish this projects comprising of 6.000 pages of documents.

*b) Up-to-date and completion of the existing work items pricing system.*

For the modernization of the Public Works budget system a multilevel pricing system based on unit prices analysis was developed while new articles had been added and old ones removed. The list of descriptive work items for pricing that prepared, including more than 10.000 articles, was based upon systematic investigation of significant number of bills of quantities of various construction projects covering all construction sectors.

This project consists a systematic approach in Greece towards a National Code of Measurement, and can be adopted by the Ministry of Public Works for the implementation of the new pay-items lists, which have been putted recently in issue.

In parallel, CEI developed a series of parametric cost estimating tools for basic work items (e.g. earthmoving works, formwork, pipe laying, dredging etc), enabling cost evaluation under variable word conditions and constraints.

*c) Statistical preliminary project cost estimation techniques.*

Scope of the project was the evaluation, further exploitation and development of an existing cost estimating data base system based on bulk project entity final cost (e.g. highway in km, bridge span in m, etc) characterized by most significant attributes (e.g. road section width, trespass terrain type, road design speed, etc).

CEI analyzed the predominant attributes for bulk project entities of various types and categories as well as the operational specifications of the structured data base system and formulated proposals for the organization and functions of the systems operator/administrator. A small scale **pilot** run of the system was also performed, using available data from recently completed projects. The results deemed to be satisfactory. CEI also assessed the impact of site expenditure on total project cost and developed a parametric indirect cost estimation tool, on the basis of fundamental project characteristics and magnitude.

*d) Implementation of educational and training programs for the construction sector.*

The project comprises of the following sections:

1. Allocation of target groups, characteristics analysis, present state evaluation.
2. Investigation of training / education requirements for each target group.
3. Preparation of detailed proposals for required training/educational courses.

*- Legal frame governing private construction.*

In order to proceed in the issuance of Presidential Decrees provisioned in pertinent legislation on building construction, MEPPPW assigned CEI to prepare drafts for PDs regulating the implementation of Private Construction Contractors Registry and Defining obligations and liabilities of the Contractor towards the project owner. CEI studied the private construction projects framework and submitted to the MEPPPW, beyond the foresaid drafts, a detailed report on the following topics:

- Establishment of subcontractors registry
- Certification of skilled laborers
- Enactment of minimal technical specification for private construction works
- Modernization of building permission granting procedures
- Enactment of construction log keeping for private works
- Enactment of “green box” installation in all buildings (containing as brief drawings and structure modifications log after completion)
- Extension of construction materials quality controls at the procedure site.

*- Operational Program for the Information Society (OPIS)*

CEI was appointed by MEPPPW as coordinator of Ministry’s General Secretariats for the promotion of funding and implementation of MEPPPW’s projects coming under EU Operational Program OPIS.

*- Revaluation of Contractors of Public Works*

C.E.I. provided technical assistance to the MEPPPW for the revaluation procedures of the Greek licensed contractors for Public Works, according to pertinent legislation and participated in the appointment of consultant-auditor for the contractor’s licenses registry of the Ministry.

*- Compilation of technical record forms for Public Works Contractors*

CEI designed the technical record forms anticipated by pertinent legislation for the valuation/revaluation of Public Work Contractors and promoted the implementation of the relevant procedures.

*- Assignment of CEI as consultant of Ministry’s Dpt for Contractors Registry*

CEI was appointed by the Ministry as consultant to the Department for contractors registry, and played a significant role in the implementation of the revaluation procedures of all Greek licensed contractors, under the provisions of the new Law introduced in the year 2001.

*- Supplementary auditing of top-ranking Public Works Contractors evaluation data files*

By ministerial decree, CEI undertook the supplementary auditing of top-ranking Public Works evaluation data files and the examination of submitted applications for license ranking.

*- Processing of Public Works Contractors financial and economic capability data.*

CEI evaluated data submitted by Contractors' companies in assistance to MEPPPW for licensing and classification and timely revaluation according to pertinent legislation.

*- Simplification of the contractors acceptance procedures in public works tendering.*

CEI contributed in the implementation of an ESP system for contractor's license validity control and license classification updating and the issue of Ministerial Circulars specifying all relative procedures.

*- Elaboration of proposals for a new framework for construction machinery licensing and circulation*

CEI analyzed the existing legal frame and prepared detailed proposals for bylaws and amendments.

*- Study of implications to road construction cost due to the fluctuation of asphalt prices.*

CEI analyzed the impact on asphaltic works cost due to the variation of fuel prices – and consequently asphalt prices – and submitted a detailed proposal to MEPPPW for asphaltic works unit prices escalation.