

# Construction Cost Engineering

## Purpose and Background

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Pressure to deliver construction projects at a faster pace has grown and many owners are now demanding that engineers and construction professionals deliver completed facilities in half the time the industry was used to having in the recent past. As a result, the need to be able to accurately estimate the cost of new projects has grown more and more important.

There is no time to rescope a project due to funding constraints. Owners, engineers and designers must be cognizant of the cost implications of design decisions throughout the project development process. To do this, they must understand the fundamental concepts of construction cost estimating from both the contractor's and the owner's perspective. Additionally, after contract award, this same group must be able to accurately analyze the cost consequences of change orders and thus facilitate the timely completion of the change process to minimize delay. Finally, the proliferation of the use of innovative project delivery methods such as Design-Build and Construction Manager-at-Risk have fundamentally changed the way engineers must approach cost engineering to account for the shifts in professional responsibility inherent to these new delivery methods.

This seminar breaks down the construction cost engineering process into its component steps and reassemble it into a straightforward, logical methodology for the development of valid cost analyses of construction projects from the owner's standpoint. The seminar alternates between lecture/discussion periods and short, high-impact team exercises that are designed to reinforce the preceding lecture's learning objectives. It offers a comprehensive view of the cost engineering process as a fully integrated system rather than the conventional approach of separate but related activities.

## Seminar Instructor

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**Douglas D. Gransberg, Ph.D., P.E., C.C.P., F.RICS, M.ASCE**, is the Donald and Sharon Greenwood Professor of Construction Engineering at Iowa State University. He received both his B.S. and M.S. degrees in Civil Engineering from Oregon State University and his Ph.D. in Civil Engineering from the University of Colorado at Boulder. He is a registered Professional Engineer in Oklahoma, Texas and Oregon, a Certified Cost Engineer, a Designated Design-Build Professional and a Fellow of the Royal Institution of Chartered Surveyors in the UK.

Before moving to academia in 1994, Dr. Gransberg spent over twenty years in the U.S. Army Corps of Engineers retiring at the rank of lieutenant colonel. In his final posting, Professor Gransberg was the Europe District's Area Engineer stationed in Ankara, Turkey where he managed an annual design and construction program that exceeded \$200 million. He teaches courses in integrated project delivery, cost estimating, project controls, and project management. His research is centered in the delivery of infrastructure/ transportation projects. Dr. Gransberg is currently leading the effort to develop the AASHTO Guidelines for CMGC project delivery and Guidebook for Alternative Quality Management. He was also one of the co-authors of the AASHTO Guide for Design-Build Contracting.

Dr. Gransberg also owns Gransberg & Associate, Inc. a construction management/project delivery consulting firm. To keep his consulting synergistic with his teaching, he provides RFQ/RFP development services to public agencies as well as CMGC and DB proposal development services to engineers and consultants.

- For group training, contact John Wyrick ([JWyrick@asce.org](mailto:JWyrick@asce.org)) or Stephanie Tomlinson ([STomlinson@asce.org](mailto:STomlinson@asce.org))

## Summary Outline

### DAY ONE

- Introduction to Cost Engineering
- Cost Scoping the Project & Using Estimating Manuals
- Conceptual Estimating
- Conceptual Estimate Practical Exercise (PE)
- Discussion of PE
- Parametric Estimating

### DAY TWO

- Work Break-down Structure (WBS) and Earned Value
- WBS-Earned Value PE
- Discussion PE
- Quantity Surveying/Take Off
- Detailed Estimating
- Special Estimates
- Design-build Fast-Track Issues
- Summary and closing remarks

## Seminar Benefits

You will learn how to develop: a conceptual cost estimate; make project-planning decisions that result in a Work Break-down Structure; develop a value-loaded construction schedule; understand the limitations of commercial estimating manuals and databases; create and properly coordinate a detailed estimate; and understand the cost engineering differences between traditional Design-bid-Build and Design-Build projects.

## Who Should Attend

This course is designed for engineers and other design professionals who represent owners and need to furnish cost engineering and estimating services in addition to design. It is also effective for those large public and private owners who have in-house technical expertise and contract for their own design and construction services.

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**John Wyrick, Director**  
**On-Site Training Worldwide**  
**ASCE Continuing Education**  
**1801 Alexander Bell Drive**  
**Reston, VA 20191-4400**  
**Tel.: 703-295-6184**  
**Email: [jwyrick@asce.org](mailto:jwyrick@asce.org)**

