



Design Effectiveness Evaluation **Tool**

Implementation Resource 245-3



CII Member Companies

Abbott	AECOM
Ameren Corporation	AMEC Foster Wheeler
American Transmission Company	AZCO
Anadarko Petroleum Corporation	Aecon Group
Anglo American	Affiliated Construction Services
Anheuser-Busch InBev	Alstom Power
Aramco Services Company	Autodesk
ArcelorMittal	Baker Concrete Construction
Architect of the Capitol	Barton Malow Company
BP America	Bechtel Group
Cargill	Bentley Systems
Chevron	Bilfinger Industrial Services
ConocoPhillips	Black & Veatch
Consolidated Edison Company of New York	Burns & McDonnell
DTE Energy	CB&I
The Dow Chemical Company	CCC Group
DuPont	CDI Engineering Solutions
Eastman Chemical Company	CH2M HILL
Ecopetrol	CSA Central
Enbridge	Cannon Design
EnLink Midstream	Coreworx
ExxonMobil Corporation	Day & Zimmermann
General Electric Company	Dresser-Rand Company
General Motors Company	eProject Management
GlaxoSmithKline	Emerson Process Management
Global Infrastructure Partners	Enstoa
Huntsman Corporation	Faithful+Gould
Intel Corporation	Fluor Corporation
Irving Oil Limited	Gross Mechanical Contractors
Kaiser Permanente	Hargrove Engineers + Constructors
Koch Industries	Hilti Corporation
Eli Lilly and Company	Honeywell International
LyondellBasell	IHI E&C International Corporation
Marathon Petroleum Corporation	IHS
National Aeronautics & Space Administration	International Rivers Consulting
NOVA Chemicals Corporation	JMJ Associates
ONEOK	JV Driver Projects
Occidental Petroleum Corporation	Jacobs
Ontario Power Generation	KBR
Pacific Gas and Electric Company	Kiewit Corporation
Petroleo Brasileiro S/A - Petrobras	Lauren Engineers & Constructors
Petroleos Mexicanos	Leidos Constructors
Petronas	Matrix Service Company
Phillips 66	McCarthy Building Companies
Pioneer Natural Resources	McDermott International
Praxair	Midwest Steel
The Procter & Gamble Company	PCL Construction Enterprises
Public Service Electric & Gas Company	PTAG
Reliance Industries Limited (RIL)	Parsons
SABIC - Saudi Basic Industries Corporation	Pathfinder
Sasol Technology	POWER Engineers
Shell Global Solutions US	Quality Execution
Smithsonian Institution	Richard Industrial Group
Southern Company	The Robins & Morton Group
Statoil ASA	S&B Engineers and Constructors
SunCoke Energy	SBM Offshore
Tennessee Valley Authority	SNC-Lavalin
TransCanada Corporation	Skanska USA
U.S. Army Corps of Engineers	Supreme Group
U.S. Department of Commerce/NIST/ Engineering Laboratory	Technip
U.S. Department of Defense/ Tricare Management Activity	Tenova
U.S. Department of Energy	TOYO-SETAL Engenharia
U.S. Department of State	UniversalPegasus International
U.S. Department of Veterans Affairs	Victaulic
U.S. General Services Administration	WESCO International
Vale	Walbridge
The Williams Companies	Wanzek Construction
	The Weitz Company
	Wilhelm Construction
	Willbros United States Holdings
	Wood Group Mustang
	WorleyParsons
	Yates Construction
	Zachry Holdings
	Zurich



Design Effectiveness Evaluation Tool

Prepared by

*Research Team 233, Planning for, Facilitating, and Evaluating
Design Effectiveness*

Research Team 245, Optimizing Engineering Value in Projects

Construction Industry Institute

Implementation Resource 245-3

March 2015

© 2015 Construction Industry Institute™

The University of Texas at Austin

CII members may reproduce and distribute this work internally in any medium at no cost to internal recipients. CII members are permitted to revise and adapt this work for their internal use, provided an informational copy is furnished to CII.

Available to non-members by purchase; however, no copies may be made or distributed, and no modifications may be made without prior written permission from CII. Contact CII at <http://construction-institute.org/catalog.htm> to purchase copies. Volume discounts may be available.

All CII members, current students, and faculty at a college or university are eligible to purchase CII products at member prices. Faculty and students at a college or university may reproduce and distribute this work without modification for educational use.

Printed in the United States of America.

Foreword

Welcome to the Design Effectiveness Evaluation Tool. This tool provides a structured approach to evaluating the design effectiveness of capital projects. This manual provides guidance on when and how to use the tool. The appendix provides a table of criteria and subcriteria by which to evaluate design efforts and products.

Note: Before starting the Design Effectiveness Evaluation Tool, please select the “Enable Macros” option when prompted.

- To save data and exit during subcriteria selection, use the buttons provided at the bottom of the tool. Saving with the default Excel function (Ctrl+S) on the subcriteria pages might cause the tool to operate improperly when restarted.

Contents

	<i>Page</i>
Foreword	iii
1. Introduction	1
2. Design Effectiveness Evaluation Tool Algorithm	3
3. Troubleshooting	5
Appendix: Design Effectiveness Evaluation Criteria & Subcriteria	7

1

Introduction

The Design Effectiveness Evaluation Tool will help users evaluate the efficiency of design for capital projects, based on the following parameters:

- the timing of the evaluation
- the relative significance of 11 different project value objectives
- the relative significance of evaluation subcriteria associated with project value objectives (PVOs).

Selection Tool Sheet Progression

Sheet 1. Introduction

Sheet 2. Project information

Sheet 3. Timing of evaluation

Sheet 4. Relative significance of PVOs
– editing subcriteria weights

Sheet 5. Subcriteria selection and evaluation

Sheet 6. Results
– review of subcriteria weights

Instructions for Use

Evaluation tool introduction

The tool's introduction sheet presents its purpose and limitations. After reading the introduction, click the “Continue” button to proceed.

Project information

The project information sheet asks the user to input basic information about the project for which the design effectiveness practice (DEP) selection is being implemented. None of these fields is required to proceed; this is only a meta-data section of the selection process. Click the “Continue” button to proceed.

Timing of evaluation

This page asks the user to indicate the approximate timing of the evaluation. Note that the evaluation timing affects the suitability of some subcriteria. Click the “Continue” button to proceed.

Relative significance of Project Value Objectives

This page asks the user to indicate the relative significance of the project value objectives (PVOs). The user may indicate the relative significance with N/A, Low, Med, High, or Custom. The weight factors are 0, 1, 2, 3, and custom, respectively. Selecting Custom as the level of significance allows the user to input his/her own weight factors for that PVO.

The user may also customize the subcriteria weights for each of the PVOs by clicking on the “Customize” button under the “Edit Subcriteria Weights” box. The user may revert back to the default subcriteria weights (the subcriteria of the PVO weighted equally) by clicking the “Default” button next to the “Customize” button. An indicator next to these two buttons will remind the user of the status of the subcriteria weights.

Clicking the “Accept & Continue” button will also update the lists, and will send the user to the next step in the DEP selection process.

Edit Subcriteria Weights

The user may edit a PVOs subcriteria weights by inputting a weight factor for the subcriteria. The default setting is a weight factor of “1” for all subcriteria.

Subcriteria selection and evaluation

This page asks the user to evaluate the subcriteria for each of the PVOs selected previously. The evaluation is done on a 0–10 scale, with the option of excluding subcriteria that do not apply.

Results

The results page presents the score of each PVO, and the composite score based on the weighted score of all the PVOs. The user may review and modify the subcriteria weights by clicking on the “Review Subcriteria Weights” button. A “Score Interpretation” button is provided near the composite score to give the user an idea about the score values.

Review Subcriteria Weights

As with the “Edit Subcriteria Weights” function on the “Relative Significance of PVOs” page, the user may review and edit the subcriteria weights of all 11 PVOs.