

Total Quality Project Management FOR THE Design Firm

Frank A. Stasiowski, AIA
David Burstein, PE

TOTAL QUALITY PROJECT MANAGEMENT FOR THE DESIGN FIRM

**How to Improve Quality, Increase
Sales, and Reduce Costs**

**FRANK A. STASIOWSKI, A.I.A.
DAVID BURSTEIN, P.E.**



JOHN WILEY & SONS, INC.

New York / Chichester / Brisbane / Toronto / Singapore

This text is printed on acid-free paper.

Copyright © 1994 by John Wiley & Sons, Inc.

All rights reserved. Published simultaneously in Canada.

Reproduction or translation of any part of this work beyond that permitted by Section 107 or 108 of the 1976 United States Copyright Act without the permission of the copyright owner is unlawful. Requests for permission or further information should be addressed to the Permissions Department, John Wiley & Sons, Inc., 605 Third Avenue, New York, NY 10158-0012.

This publication is designed to provide accurate and authoritative information in regard to the subject matter covered. It is sold with the understanding that the publisher is not engaged in rendering legal, accounting, or other professional services. If legal advice or other expert assistance is required, the services of a competent professional person should be sought.

Library of Congress Cataloging in Publication Data:

Stasiowski, Frank, 1948—

Total quality project management for the design firm : how to improve quality, increase sales, and reduce costs / Frank A. Stasiowski, David Bernstein.

p. cm.

Includes index.

ISBN 0-471-30787-4 (alk. paper)

1. Architectural firms—United States—Management. 2. Engineering firms—United States—Management. 3. Small business—United States—Cash position. I. Burstein, David, 1947— . II. Title.

NA1996.S755 1994

720'.68'5—dc20

93-19850

Printed in the United States of America

10 9 8 7 6 5 4 3

PREFACE

Much has been written about quality assurance and quality control techniques for design and construction projects. These techniques have been developed over many years—and they work. Design firms that apply them properly produce high quality designs that can be built without the need for excessive field changes.

The problem with these traditional techniques is their *cost*. According to a study conducted by the corporate engineering department of Owens-Corning Fiberglass Corporation, approximately 20% of design budgets are expended for reviews and corrections conducted after the design documents have been completed. Adding the costs of interim reviews and corrections, an average design project can easily require 30 to 50% of its budget to locate and correct errors!

Attempts to impose ever more stringent quality control methods to reduce design errors have resulted in a spiral of ever-increasing design costs. As clients become increasingly resistant to higher costs and increasingly demanding of higher quality, design firms are caught in a squeeze that forces them to sacrifice either quality or design cost or both. These sacrifices result in lost profits, lost clients, or both.

Fortunately, there is an escape from this dilemma. The same quality improvement methods that have been used so successfully in manufacturing can be adapted to design projects. In fact, they can also be adapted to solve sales, administration, budget control, and other problems that often plague design firms. This book describes how. It is written by design professionals who have had direct experience with Total Quality Project Management in design firms. The concepts presented are not theoretical. They have all been tried—and they work!

July 1993

FRANK A. STASIOWSKI
DAVID BURSTEIN

ACKNOWLEDGMENTS

The authors would like to personally acknowledge the efforts of every individual who helped develop this book, but this list would be too long to be practical. Particular thanks go to the officers and employees of the Ralph M. Parsons Company and Engineering-Science, Inc., whose pioneering efforts in Total Quality Project Management have provided much of the material presented in this book. Among these are Colin Knight, Quality Improvement Administrator for The Ralph M. Parsons Company; Nick Preseran, Manager of Technical Direction for Engineering-Science, Inc.; and Rose Deslaurier, Quality Improvement Administrator for the Engineering-Science, Inc. Atlanta office. The authors also thank Julia Willard for her *valuable reviews and incisive comments*.

CONTENTS

Introduction	1
1. A Commitment to TQPM Is a Marketing Issue	7
2. The Design Firm as Fishing Village	15
3. Changing the Way We Think about Quality	25
4. Improving the Quality of Design Projects	47
5. Improving the Quality of Studies and Reports	105
6. Improving the Quality of Construction Services	135
7. Improving Management, Administration, and Marketing	173
8. Keeping Your Clients Happy	235
9. Eliminating Quality Problems—Permanently	265
10. Implementing TQPM in Your Organization	317
Appendix A Glossary of Terms Commonly Used in Total Quality Project Management	355
Appendix B Checklists for Design Reviews	367

Appendix C Claims Discovery Checklist	383
Appendix D Guidelines for Shop Drawing Review	389
Appendix E Quality Bibliography	395
Index	397

INTRODUCTION

It is in vogue to criticize the poor quality of American goods and services. Consider the fact that IBM, known for its high quality standards, spent \$2.4 billion in warranty costs in 1989*. Unfortunately, the record of engineering, architectural, and other technical service firms is no better, often worse. Do any of these quality problems sound familiar?

Case History #1. A civil engineering firm was hired by a municipality to design 20,000 feet of new sewer lines and inspect their construction. Poor compaction of backfill by the contractor resulted in collapse of the paving in many sections of the new sewer system. The municipality sued the contractor for poor construction and sued the engineering firm for poor inspection.

Case History #2. A representative of an engineering firm visited a textile plant and promised to send the client a report on the findings. The report was sent late and the client refused to pay for the costs of the visit. The engineering firm suffered an \$8,200 loss in uncollectible costs plus loss of reputation with a long-term client.

Case History #3. An architectural firm contracted with a client for a small project that was scheduled to last three and a half months. Midway through, the project was delayed by the client. By the time it was restarted, the design firm's personnel had been diverted to other jobs and had lost interest in this project. Agreed-upon completion dates came and went without any information to the client from the design firm's project manager. Result: although the client was satisfied with the technical qual-

*Source: "Pursing Zero Defects Under the Six Sigma Banner," *New York Times*, January 13, 1991.

ity of the work, the design firm's numerous delays precluded the firm from working there on any future jobs.

Case History #4. A surveyor was retained by a large engineering firm to perform a topographic site survey and to locate existing underground utilities. During a routine site visit by the engineering firm, some apparent discrepancies were noted between the elevations shown on the surveyor's drawings and the actual elevations in the field. More detailed spot-checks by the engineering firm revealed several significant discrepancies. The engineering firm refused to pay the surveyor's \$14,000 invoice, hired another surveyor to redo the work, and will never again use the first surveyor's services.

Case History #5. As part of the design of a chemical plant expansion, an engineering firm asked a vessel manufacturer for its recommendation on the best protective coating. The sales representative provided the recommendation, which was then included in the design without being reviewed by the coating manufacturer or the engineering firm's in-house corrosion expert. Shortly after start-up, the coating failed, requiring the tank to be shut down for several months and relined with a more suitable material. The client spent \$45,000 to reline the tank and \$125,000 in extra operating costs to compensate for this unit being out of service. The engineering firm agreed to bear \$38,000 worth of engineering costs; its reputation with the client also suffered greatly.

Case History #6. An architectural firm had a contract to design a small building. The soils report called for removal and recompaction of the top few feet of soil prior to construction of the building foundation. The project's lead structural engineer assumed that this requirement was being handled in the earthwork specs (written by the civil engineer). The civil engineer assumed it has been taken care of by the structural engineer. The problem was not discovered until the construction contractor noticed major cracks appearing in the floor slab. The owner had to issue a major change order and sued the architectural firm for negligence.

Case History #7. A systems engineering firm was contracted to install a computerized maintenance system for a chemical plant. The due date came and went with no product delivered and no contact by the engineering firm's project manager. The client eventually called the firm's project manager, who apologized and gave him a

second due date. When this date also passed without product being delivered or the project manager contacting the client, the client called a principal of the firm and expressed his dissatisfaction. The product was finally delivered on the third due date. The firm's poor performance on this "front end" project killed its chances of securing the lucrative follow-on activities.

Case History #8. A hydrogeologic firm was required to do packer testing of a well. The firm's project manager requested that a pump be sent to the site. The pump worked properly when installed, but failed after six hours. A second pump was requested and was sent via Federal Express the next day. Because of an incorrect address label, Federal Express sent it to the wrong city, delaying its arrival by another day. When it was finally installed, it also failed after about six hours. The field crew finished by hand bailing the well. The result was over \$8,000 in uncollectible costs due to driller downtime.

Are these foul-ups unavoidable? Must firms spend more and more money attempting to fix these kinds of problems? Does the answer lie in more sophisticated and costly quality assurance and quality control programs? Are clients willing to pay the added costs required for such programs? *NO!* Quality problems in design firms can (and must) be prevented while *at the same time* reducing costs! How? By a concept called Total Quality Project Management (TQPM).

This book does not focus on quality as defined by the U.S. legal system (although legal issues are addressed). It does not dwell on elaborate procedures for checking drawings (although such procedures are discussed). It does not focus on shop drawing review or construction inspection techniques (although some information on these subjects is provided). It does not concentrate on handling quality assurance paperwork (although some suggested documentation methods are presented).

This book presents an entirely new way of looking at quality in engineering, architectural, and other technical service firms. The word "quality" doesn't just mean how easily a design can be built, how functional the resulting facility will be, or how attractive it will look. The discussion of quality also includes such issues as how close the project came to its original schedule and budget, how happy the client is, and how satisfied the firm's employees are. In short, it includes

every aspect of how a technical service firm conducts its business.

Total Quality Project Management is not new. The concept of controlling quality by using measurement techniques, conforming to requirements, and targeting zero defects was developed in the United States during World War II. After the war, General Douglas MacArthur sent Dr. W. Edward Deming to Japan to help that defeated and largely destroyed nation rebuild its economy. Deming's approach was simple: you look for waste, measure its cost, determine what caused it, and get everyone involved to fix it so that it doesn't happen again. Japan's industry leaders listened to Deming and heeded his advice; the rest is history.

By the early 1980s, it had become apparent to U.S. industrial leaders that the Japanese were beating them at their own game—producing high quality products at reasonable prices. They therefore consulted with Deming as well as other quality experts such as Dr. J. M. Juran and Philip Crosby. They even read quality manuals prepared by Japanese experts such as Masaaki Imai and Masao Nemoto. The result has been a dramatic improvement in the quality of American manufactured goods, faster cycle times in getting new products to market, and reduction of costs resulting from waste and rework. The impact on the competitiveness of the U.S. economy has been dramatic, as evidenced by the following*:

1. Productivity in U.S. manufacturing has increased at an average rate of 3.1% per year since 1983, faster than either Japan or Germany.
2. U.S. exports have grown by 9.5% per year since 1985.
3. By the end of 1990, the U.S. had regained its position as the world's largest exporting nation.
4. The U.S. overall trade deficit, which had deteriorated to \$146 billion by 1987, has decreased to \$7 billion by the end of 1991.
5. Importation of foreign capital has been reduced from a peak of \$150 billion in 1987 to virtually zero in 1991.

To date, professional service firms have generally remained on the sidelines, seeing no reason to change the business

*Source: "The World's Most Competitive Economy," *Forbes*, March 30, 1992.

practices that have proven successful for them over the years. But history has shown that those who fail to adapt to changes in the marketplace eventually will fall by the wayside. And those changes *are* taking place. Consider the following trends in the markets served by architects, engineers, geologists, and other technical professionals:

1. Clients are insisting on a higher standard of perfection than ever before.
2. They are more eager to sue if they don't get it.
3. At the same time, they are insisting on lower costs and shorter schedules.
4. Foreign firms are entering the market, particularly from Europe and Japan, increasing competitive pressures.
5. Capital requirements for CAD and other major investments require design firms to become more profitable in spite of these obstacles.
6. There are not enough qualified technical professionals available to meet the needs of growing firms.
7. Fewer design professionals are serving in formal apprentice programs; instead, design firms (and their clients) are demanding full performance from day one.
8. Employees are becoming less willing to dedicate their lives to their companies and are demanding more from their employers.

Do you see any of these trends in your organization? Do you believe that traditional approaches will deal with them adequately? Are you willing to bet your company's and your personal future that they will? If not, read on. Find out how the same quality improvement approaches used so successfully by Japanese and American manufacturers can be adapted to the kinds of problems you routinely encounter.

A COMMITMENT TO TQPM IS A MARKETING ISSUE

At the heart of all litigation, is the absence of quality.

The idea that each individual in a firm should continually improve his or her work is neither novel nor easy. Yet in today's marketplace, excellent quality design and construction are no longer selling points, but are expected and even demanded by the client. A program devoted to continual upgrading and preening of a company's resources will be the key to business longevity in the 1990s.

Touting your assets by proclaiming "We provide quality work" is no longer the way to go. In fact, such an approach will only place your firm among the ranks of thousands of other firms out there who believe that "good work" is their greatest asset. It's no great step in the direction of improving design or your image in the marketplace to say you are improving your quality. And that's not what Total Quality Project Management is all about. TQPM is about taking your clients to greater heights through a planned program of continual improvement of your firm's work processes and project management techniques. Taking the client to greater heights means that you are providing greater service, faster production, better ideas, more cost-effective ways in which to produce the work. This translates into client benefits such as saving the client money, accelerating schedules, and reducing problems during construction and startup.

THE ORIGINS OF TQM

You may recall that the source of Total Quality Management was the industrial engineering expert Dr. W. Edward Deming, who helped post-war Japan rebuild its industrial base after World War II. By the late 1980s it had become evident to U.S. manufacturing firms who had ignored TQM, that the system was working for the Japanese and that they'd better get in on it too. Corporate executives with manufacturing firms began to adopt Total Quality Management concepts and apply them to their organizations. Since that time, production in American manufacturing firms has greatly increased (and statistics on this are cited later in this text). The design professions have, however, not as yet succumbed to TQM, mainly because until now, they were not pushed to do so. Now the time has come.

Today, many governmental and industrial clients are demanding that design firms have Total Quality Management practices in place in order to bid projects. But merely having a TQM is not "enough" design: professionals find themselves with no choice but to incorporate TQM into the way they do their projects. This book explains how to use Total Quality Management techniques in your firm to deliver high quality projects to your clients: hence the term Total Quality Project Management.

If you do not adopt a policy of leadership in innovation and customer service delivery, at this point, you'll be left behind by those firms scrambling to sell the best service at the lowest possible price—touting Total Quality Project Management all the way.

HOW DO YOU "THINK" TOPM?

If you are like most design professionals, your first thought in setting up a Total Quality Project Management program is marketing and, beyond marketing, client satisfaction. Marketing in and of itself is a necessary, but increasingly outdated, concept. Because "marketing" implies internal processes and actions, "client-focused service" is a better way to consider the process. Total Quality Project Management is an integral part of the client-focused service element of your firm. And, naturally, as with traditional "marketing," the better job you do at providing, aiming, shooting for, and targeting "client service," the more money you make, the more work you have, and so on.

There are basically going to be three different types of design firms in the 1990s, with regards to client focus:

1. Internally Focused

These companies focus on their own products/services and believe that internally focused quality is the only way to get the "best" clients. These firms will not prosper, because quality alone, without faster and better service, eats up profits and is not enough of a selling point to attract demanding, high-grade clientele.

2. Service Focused

These firms do exactly what their clients ask for . . . construct buildings, provide exacting designs . . . and nothing more. These firms will struggle for profitability in the 1990s, because they are not adding their own value to the project.

3. Externally Focused, Value-Added

The third class of firms will truly succeed. These companies take clients to heights that the client never expected. They have working Total Quality Project Management processes to continually evaluate and revamp their services. They will position themselves as being providers not only of top quality design, but of excellent service (quickness of delivery, saving the client money, and so on). These firms use "expeditionary" marketing tactics to distinguish themselves from their competitors.

Figure 1.1 Internally vs. externally focused firms.

Total Quality Project Management is an outgrowth of that process. It is a new way of servicing the client that is more client-focused, that will bring the client to greater heights than he or she ever expected. Gary Hamel, Associate Professor of the London Business School, and C. K. Prahalad, Professor of Corporate Strategy at the University of Michigan, have expounded an idea they term "expeditionary marketing." They feel that in order to market service businesses in the 1990s, you have to expand your "corporate imagination" and embark on an "expedition" to excel beyond your peers. In design, the boat on which to ride for the expedition is Total Quality Project Management.

This book shows you how to better your project management processes, so that you may improve client service. This is an external, not an internal focus (see Figure 1.1). By improving upon the services you provide to the client, you will improve your "marketing" effort. After all, your job as the design professional is to truly inspire the client to reach for greater heights than they could have imagined, to look beyond their own horizon.

UNCOVERING THE CLIENT'S HIDDEN AGENDA

The Mayor of Denver, Colorado, recently spoke at a meeting of the American Society of Consulting Engineers in Denver. He made the point of meeting a client's needs—the hidden agenda—very clear. He spoke of the new Denver airport. There were many levels of satisfaction going on during the project. In addition to the issues of quality, budget, and schedule, he had his own concerns with getting the project finished on time, since he was up for reelection the year it was to be completed. He was extremely disturbed by the thought of having to go back to the city's building committee with any news of delaying the project. As Mayor of the city, he wanted to make this the gem of his administration. The true job of the architects and engineers on the project, then, was to realize this end goal: to create a fabulous “gem” of an airport, on time, before election season. That was the true need of the mayor in question, and since the mayor was in charge of hiring future design professionals, his opinion of the airport mattered most.

HOW DO YOU DETERMINE THE CLIENT'S HIDDEN AGENDA?

By listening! Read up on listening techniques. There isn't enough space in this text to explain the entire concept of listening to your client's expectations, but suffice it to say that if you don't truly know how to listen, you will never get to the crux of the client's issue. If you don't get to the heart of the client's needs and wants, you won't get hired again, your firm will not be talked about by your client, and it will not be recommended to others!

Let's not be bound by what we traditionally believe is the way that design practices must be run. The client should feel as if he or she is the only client the firm is dealing with. Instead of telling the client how great you are, show him that you feel he or she is. This attitude speaks for itself!

HERE'S AN EXAMPLE

Engineering-Science, of which one of the authors is Vice President, assigns a senior staff member as “client sponsor”