



The Business Roundtable

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157

**A MESSAGE TO OWNERS
WHO PAY FOR
MAJOR CONSTRUCTION**

**A Report On
THE CONSTRUCTION INDUSTRY
COST EFFECTIVENESS PROJECT**

**THE BUSINESS ROUNDTABLE
200 PARK AVENUE
NEW YORK, NEW YORK 10166
(212) 682-6370**



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To Owners Who Pay For Major Construction

This is an executive summary of the findings and recommendations of the Business Roundtable's Construction Industry Cost Effectiveness Project.

This project is one of the most important undertakings in the history of the Roundtable, having involved more than 250 construction specialists representing some 125 companies and organizations over a period of more than four years.

I commend the study to your attention because I believe that large amounts can be saved by owners in construction bills if we accept and act on the recommendations. Those responsible for the study believe that these savings can amount to \$10 billion a year.

You will find the essence of the project report in the concise list of key findings and executive summary. Two additional levels of detail are available: a comprehensive summary of 96 pages and 23 individual reports covering specific aspects of construction which are available from the New York office of the Roundtable.

Only with your active participation will it be possible to carry out these landmark recommendations. The driving force for improvement in the industry is the owner—he has both the incentive and the means to bring it about.

Sincerely,

Ruben F. Mettler
Chairman

MORE CONSTRUCTION FOR THE MONEY

A Report On The Construction Industry Cost Effectiveness Project

(Some Key Findings)

1. Owners no longer get their money's worth for construction.
2. Change is needed in what owners permit, require and accept responsibility for.
3. Modern management systems are surely needed in construction and could bring financial returns of 20 times their cost.
4. More than half the time wasted during construction is attributable to poor management practices.
5. Owners can help to save lives, injuries, and billions of dollars by giving diligent attention to safety in construction.
6. Forcing scheduled overtime with the aim of speeding completion of a project is extremely counterproductive, wasteful and generally delays the completion-date.
7. Spending time and money to help train foremen and general foremen and to train and motivate workers can bring very significant financial returns.
8. Owners should take the lead in fostering improved technology in construction – which is seriously needed.
9. Construction contracts have an enormous impact on cost and should have more owner attention.
10. To help overcome problems involving organized labor, owners should support contractors in contractual arrangements and during bargaining.
11. Inefficient assignment of work to avoid jurisdictional disputes and inefficient work practices, common in the industry, add greatly to the cost of labor and should be resisted.
12. Owners should try to persuade government regulators to ease limits on the use of modern training methods for construction workers and to permit use of less-skilled workers for jobs they can perform on government-aided work.

Owners, who pay the bills, no longer get their money's worth for construction in the U.S. Since the mid-sixties, productivity in construction, the nation's largest industry, has been falling at a rate many industry leaders find appalling. *The Houston-based American Productivity Center, measuring labor productivity in 11 large sectors of the economy over three decades, has found construction to be the most laggard performer by a wide margin.*

The problem has reached such proportions that it requires fundamental and far-reaching alterations in the way the construction industry works, in the whole process by which structures are put together. Changes are needed in the way construction is planned, managed, accounted for, thought about and regulated. Changes are needed in tools, techniques and technology. Change is needed in how workers are trained, supervised, motivated and paid. And *change is needed in what owners permit, require and accept responsibility for.*

This is the central message of The Business Roundtable Construction Industry Cost Effectiveness Project, a four-year study of how to remove inefficiencies from the construction process. The study was made by more than 250 seasoned construction professionals representing more than 125 companies and other organizations. The study teams focused on what hinders productivity in industrial facilities, office and commercial buildings and power plants — the types of construction that members of The Business Roundtable pay for. Their 220 recommendations for action by owners, contractors, trade associations, labor, government, academia and others, form a how-to-do-it handbook of practical steps to enable the construction industry to give owners more for their money.

If the recommendations are carried out only to a moderate degree, the study teams conclude, total savings should amount to at least \$10 billion annually. Examples: A reasonable reduction in the frequency and severity of job-site accidents might lower their estimated \$8.9 billion annual cost by \$2.75 billion — 8% of the direct-construction labor payroll. If high rates of absenteeism and personnel turnover on large projects can be cut in half, labor-cost savings should range from 5% to 10% per project. Another promising money-saver is wider use of modern management systems providing a finer grip on

- 1) planning and scheduling,
- 2) cost estimating, budgeting and control accounting,
- 3) quality assurance, and
- 4) materials management.

Most of the recommendations involve ways to manage construction projects better — for instance, more careful planning, improved communications, more effective supervision, more thoughtful personnel and manpower policies. *More than half the time wasted during construction, the study teams found, is attributable to poor management practices.* Again and again, study teams concluded, only if owners who pay the bills take extra pains and pay the often small extra cost of more effective methods, will they reap the reward of more construction for their money.

Another common theme runs through the studies: More teamwork is required to improve construction efficiency. There needs to be more shared efforts at training and education, more joint research and developments to speed the use of new technology, more sharing of cost data and more communication and understanding about bargaining with labor.

THE POTENTIAL OF MODERN MANAGEMENT SYSTEMS

There appears to be considerable justification for the complaint that the construction industry has been sluggish about adopting modern management systems to plan and build projects. Many contend this is a prime reason for long delays in schedules and the big cost overruns that have plagued construction — notably large and complex projects — in recent years. *Owners have ample financial incentive to adopt more modern management techniques — a potential for saving 20 or more times the extra cost of installing and using the systems.* What's needed (as noted earlier) is much more accurate and timely controls over design, planning and scheduling, budgeting, procurement, material logistics and quality assurance.

If a modern management system is to operate properly, the system for each function must be self-contained and report data required for control of that function. It also must be tied together so that a change of data in one system will be reflected immediately in the other related systems.

Schedule time and costs can be reduced by a “planned constructability” program. The essence is simple: A seasoned project manager or construction manager sits with engineers as they prepare project designs, to help avoid unnecessary cost-boosting plans. Too many engineers, lacking job-site experience, may not be up to date about how to build what they design, or how to design so structures and equipment can be erected most efficiently.

IMPROVING CONSTRUCTION SAFETY

Construction is one of the nation's most hazardous occupations. Work-related injuries and illnesses (including deaths) occur at a rate 54% higher than the average rate for all U.S. industries. With 6% of the nation's work force, construction accounts for 10% of all occupational injuries and 20% of work-related fatalities. In addition to the humanitarian reasons for preventing personal injury, the \$8.9 billion-a-year-cost of accidents gives both contractors and owners every reason to bear down harder on safety — especially owners, for they pay the bill one way or another.

Contractors, of course, are responsible for safety at job sites. But owners' attitudes — and diligent attention — can make an important difference in the probable frequency and severity of mishaps. First of all, owners should consider a potential contractor's safety record in the past, because a good safety performance is apt to continue. They should give financial support to contractors' efforts to run effective safety programs, realizing that results will require persistent management commitment. And *owners should become more involved in safety at job sites, among other ways by setting safety and health guidelines that contractors must follow, by requiring special permits for hazardous work, by conducting safety audits during construction, and by requiring prompt and thorough investigation of all accidents — not only for legal reasons, but also to discover causes and fend off recurrences.*

THE DRAWBACKS OF SCHEDULED OVERTIME

Confronted by real or threatened manpower shortages, or pressured by an impatient owner, contractors sometimes have placed the construction of large industrial and power facilities on a long-sustained basis of scheduled overtime. The arrangement, by offering craftsmen time-and-a-half or double-time for work in excess of 40 hours a week, does attract workers, sometimes from hundreds of miles away. But in terms of efficiency, it is extraordinarily counter-productive and a waste of the owner's money.

Reaffirming a Roundtable report first issued in 1971, the study finds that scheduled overtime at large projects disrupts the area's economy, magnifies any existing labor shortage, reduces labor productivity and inflates construction costs without the hoped-for payoff of an earlier completion date. *In fact, if a schedule of 60 hours or more a week continues for more than about two months, productivity falls so much that the project's completion date generally stretches beyond what it would have been with the same crew work-*

ing a 40-hour week. Owners can control the matter, especially if they refuse to let contractors use scheduled overtime as a recruiting lure.

UNDERTRAINED FOREMEN

Inadequate training of foremen and general foremen (the next rank up) contributes to rising construction costs and dwindling productivity. The missing element is seldom their technical skill as craftsmen which may win them their job. It is too little or no schooling in such supervisory techniques as communicating with craftsmen and planning their work. *In a recent survey among 130 contractors – both union and open-shop – only 13% reported that they give any training in the arts of supervising before assigning an individual as a foreman, the first level of construction supervision.*

Contractors are often reluctant to propose training programs. Yet a Roundtable study team found that *owners who do give financial support to training foremen and general foremen can reasonably expect a return of “at least three to one” on that investment.*

DEMOTIVATED WORKERS

A long list of things that can – and do – go wrong at job sites seem to turn off craftsmen or demotivate them, as the experts put it. The seven most common complaints are:

- 1) unavailability of materials,
- 2) confusion at the project site,
- 3) incompetent supervisors (i.e. foreman or general foremen),
- 4) break-downs in communications,
- 5) re-doing work already completed,
- 6) unavailability of tools or equipment, and
- 7) disrespectful treatment by supervisors.

Most of these problems are plainly management’s fault – at one level or another. *Eliminating demotivators is up to management at all levels.*

The demotivated worker is also the main problem in two other sources of shrinking productivity in construction: absenteeism and job turnover. Craftsmen stay away from work, or quit entirely, much more often because of excessive rework on the job, poor supervision, unsafe working conditions, or uncomfortable relations with their immediate boss, than they do because of personal or family illness. Owners should support contractors’ motivation programs.

TRAINING AND EDUCATION: AN UNDERUSED RESOURCE

Over the years the building trades unions have bargained their way into an apparently adequate supply of funds from contractors to support training of apprentices, trade by trade. But open shop construction is starved for money to train its workers. In 1980, some \$230 million went into union training programs, while less than 10% of this amount was being spent to train open shop workers. Yet open shop contractors, according to the latest estimate, now account for 60% of all construction.

The consequence of contractor apathy, plus a considerable amount of ignorance among owners about the situation, is a looming shortage of trained craftsmen that may well sharply limit the capability and growth of open shop construction later in the Eighties. The shortage will also affect union construction as well. The Labor Department predicted in a 1980 report that 2.4 million new construction craftsmen will be needed by the end of the decade — 900,000 to fill new jobs and 1.5 million to replace retirees and those who shift to other lines of work. But training programs were producing only an average of 50,000 craftsmen annually. At this rate, a shortage of 1.9 million construction workers could appear by 1990.

Owners could help fight this impending squeeze by encouraging *the development of more and broader training programs.*

Vocational education, a potential resource for helping to overcome the potential shortage of craftsmen a few years hence, has been sadly underused. It would be helpful if owners, with contractors and their trade associations, would support a broadbased national group to improve communication between construction leaders and vocational-education officials.

At the college levels, neither the owners nor contractors are much involved in construction education. The industry's contributions to universities for construction research are minuscule. A study team survey indicates that the demand for university-trained project managers (who run an entire job from inception to completion) and construction managers (who take charge of on-site construction) may well exceed the supply by about 2,500 persons a year over the next five years. Owners and contractors, the study teams suggest, ought to encourage employees to get bachelor's degrees in construction management or engineering. They should also provide incentives for masters' degrees in construction programs. Both should give substantially increased financial support (i.e. grants) to universities and colleges. It is important that the money be earmarked for construction programs research, scholarships and the like.

THE PROMISE OF IMPROVED TECHNOLOGY

The construction industry adopts technological innovations much more slowly than it could and should. Some promising new technology goes unused for years — another reason construction costs have been increasing so rapidly.

Technological progress is probably more difficult in construction than in most other industrial areas because the construction industry consists of so many almost independent parts and pieces, with limited spheres of influence and for the most part limited geographical range. One consequence is a void in information channels linking the entire industry. Word about new technology has to be fed a drop at a time into a lot of places, rather than into a central organization that spreads it where it's needed.

A Roundtable study team concludes that *if much is to be accomplished to speed today's snail pace of new ideas from inventor to wide use at job sites, owners will have to take the lead*. No other industry participant has the money or the incentive. The study team found documented returns ranging from 10-1 to 20-1 for time and labor force training spent putting new construction technology to work in specific projects. Owners jointly could form a central clearing house to gather information about what's needed and what's available, and relay the information to companies that might profit from it.

Many costly and time consuming tasks common to much industrial, commercial and power-plant construction, cry out for better technology, as yet undevised. A Roundtable study team envisages that owners and contractors, acting together, could start a national research and development effort to plug these gaps. For instance, using a criteria of potential benefits to costs as high as 100 to 1, an industry-wide outlay of \$20 million dollars a year could be justified for the three areas of piping, electrical work, and installation of mechanical equipment alone.

A ROLE FOR BETTER CONSTRUCTION CONTRACTS

Legal costs have been rising in construction, as they have for many other kinds of business activities. One big reason is the increasing complexity of contracting arrangements. *Few items have a larger impact on project costs than the legal documents which establish the basis for construction responsibilities*. A representative sample of major owners and contractors estimates that the way contracts are written can add about 5% to the cost of typical projects.

The first step for owners is meticulous preparation before letting a contract. To devise a contract strategy, an owner should assess the general risks plus any risks peculiar to the project involved. Then he should decide rationally which risks his organization has the experience and capability to assume. Only then is he ready to settle on a strategy to match his objectives and resources with those of the contractor.

PROBLEMS INVOLVING ORGANIZED LABOR

From their early years, building trades unions have insisted that they alone should decide what work should be performed by each craft. But exclusive jurisdiction has become a major source of costly inefficiencies in union construction. Probably more costly, in the aggregate, than the delays and work stoppages arising from jurisdictional disputes are inefficient work assignments contractors make to avoid disputes.

To help overcome this and other labor problems, contractors need support from owners, notably in contractual arrangements and during bargaining with unions. Representatives at job sites need to be more knowledgeable about jurisdictional matters, their rights and roles in assigning work and resolving disputes. Jurisdictional agreements need revision to enable contractors to assign work in more efficient ways; toward this end unions should recognize that there is much construction work that almost any able-bodied craftsman could do. Owners, if faced by unlawful pressures, should not hesitate to take legal action, including suing for damages.

In local bargaining, owner support will be essential if contractors are to have much chance of success in trading off future wage increases for reductions in costly restrictive provisions, such as excessive crew sizes or overtime rates, and pay for non-working time.

Inefficient work practices *not* required by collective bargaining pacts — and many that are specifically prohibited — also pervade unionized construction of industrial, utility and commercial projects. The practices include work restrictions, excessive premium payments and non-productive working time (late starts, early quits, excessive time for washing up and unauthorized breaks, mostly for coffee or smoking). Together, these practices add an estimated 15% to the cost of union labor. Owners and their contractors should reach an understanding about job rules, work practices, and labor relation strategies before construction begins. Owners also should schedule projects with realistic completion dates to avoid manpower shortages and resulting pressures for completion, which promote the growth of inefficiencies.

Problems with foremen and general foremen, noted earlier, are compounded in unionized projects by the fact that both are usually members of the same local union as the workers they supervise. They consider the local business agent their *de facto* employer and look to him for wage bargaining, pensions and — more important — their next job. Naturally, their motives and actions often conflict with management efforts to increase productivity. Owners should encourage contractors to exercise fully their rights under existing labor agreements in choosing and handling foremen and general foremen. Owners also need to support contractor efforts, in future bargaining, to remove restrictions on the management role of supervisors.

The major economic advantage enjoyed by open shop contractors is their freedom to employ a high ratio of semi-skilled workers, typically 40% or more of their craft work force. Most union contractors can have no more than 10% of their crews as lower cost apprentices. This split does not fit the realities of construction. At least 40% or 50% of construction requires a minimum skill or a limited skill easily learned, and can safely and more economically be done by helpers or subjourneymen.

Owners can help union contractors in several ways to use a higher ratio of subjourneymen. Language about subjourneymen can be included in bid documents for individual projects. Where a project agreement is envisaged, owners can consider including a specific plan to use subjourneymen in the contract. Owners should always monitor projects to make sure that contractors are using subjourneymen to the maximum feasible extent.

FEDERAL LIMITS ON INNOVATION IN TRAINING

It is scarcely unusual in the U.S. for people or activity being regulated to seize control of the apparatus and turn it to their own ends. This is the case with construction training. The Labor Department, mainly at the behest of organized labor, anxious to preserve what grip it has on the route to becoming a construction journeyman, has imposed limits on the use of modern training methods. It does so through the administration of the controversial Davis-Bacon Act, which requires that locally “prevailing wages” be paid to all workers on federally financed or federally aided construction, and through standards promulgated by its Bureau of Apprenticeship.

Owners, acting individually or jointly, can help by trying to persuade federal and state regulators to permit use of subjourneymen or helpers on government-aided work. They can also help by trying to persuade the Bureau of Apprenticeship to modify its apprenticeship

APPENDIX

A. CONSTRUCTION INDUSTRY COST EFFECTIVENESS TASK FORCE

Charles D. Brown (Chairman 1978–1981)
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Thomas E. Dailey
R.E. Dailey & Company

Warren J. Ferguson
Puget Sound Power & Light Company

William A. Gabig
Shell Oil Company

Robert S. Greeson (Chairman 1981– present)
Union Carbide Corporation

Robert P. Hukill
Sun Company

Richard F. Kibben
The Business Roundtable

H. Edgar Lore
Dravo Corporation (Retired)

John E. Rasmussen
Potomac Electric Power Company

Victor T. Strom
The Port Authority of New York and New Jersey

Jack E. Turner (Chairman 1977–1978)
The Dow Chemical Company

Raymond E. Williams
American Telephone & Telegraph Company

John W. Williamson
American Telephone & Telegraph Company

Carroll H. Dunn, Project Director
Consolidated Edison Company of New York (Retired)
U.S. Army, Corps of Engineers (Retired)

B. PARTICIPATING INDIVIDUALS

James K. Addison	James A. Bent	Ronald L. Brunner
Louis E. Alfeld	G. D. Bergeron	William Burdick
Alan D. Anderson	John A. Bernay	Ed Burney
Leo Anholt	Walter T. Berner	Jack Buttrum
Robert F. Atkinson	Robert L. Bibb, Jr.	J.J. Callaham, III
James K. Bagley	John C. Bingham	Cris E. Campos
Dennis Barber	John D. Borcharding	B.J. Capshaw
Michael J. Barret	Frank J. Boyd	R.L. Carr
Donald S. Barrie	Dennis K. Bradshaw	R.D. Casey
Joseph E. Bartell	Eugene Bradshaw	James Cerra
Donald H. Basgen	Richard A. Bradshaw, Jr.	William C. Chambers
G. Stan Bates	Gurney Breckenfeld	Donald B. Clark
G. Wallace Bates	Joseph K. Briskin	Lloyd Clauss
Hugh R. Beaton	Roger A. Brooks	James R. Cleveland, Jr.
Don Beatty	Brisbane H. Brown	Robert Coffield
Daniel J. Bennet	Charles D. Brown	J.L. Coffman

Doy F. Cole
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Jack E. Turner
LeRoy R. Turner
Robert Turner
Francis Tuttle
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Alan P. Vila
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John W. Williamson
Edward L. Wilson
Foster C. Wilson
Frank B. Wingate
Kenneth Winkler
Robert L. Wooten
Travis Wunderlich
John E. Yager
Hansel York
Ingo Zeise

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Alabama Power Company
J.S. Alberici Construction Company
Aluminum Company of America
Amoco Oil Company
American Cyanamid Company
American Electric Power Service Corporation
American Telephone & Telegraph Company
Associated Builders & Contractors
The Associated General Contractors of America
Bechtel Group, Inc.
B E & K Construction Company
C.F. Braun
Brown & Root, Inc.
Burns & Roe
Caterpillar Tractor Company
CEMA, Inc.
City of Cincinnati, Ohio
City of San Francisco, California
City of Worcester, Massachusetts
Cleveland Electric Company
Consolidated Edison Company of New York
Construction Engineering Research Laboratory, Corps of Engineers, U.S. Army
Construction Labor Research Council
Constructors Association of Sabine Area
County of Henrico, Virginia
R.E. Dailey & Company

Daniel Construction Company
Davy-McKee Corporation
Diamond Shamrock Corporation
DM International
Dow Chemical Company
Dravo Corporation
The Dunbar Construction Company Inc.
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Florida Power & Light Company
Fluor Corporation
Foster Wheeler Corporation
Fruin-Colnon Corporation
General Motors Corporation
General Public Utilities Corporation
Georgia-Area Construction Users, Inc.
Georgia-Pacific Corporation
Georgia-Power Company
Gulf States, Inc.
Harvard/M.I.T. Joint Center for Urban Studies
Hoffman Architects
Honeywell, Inc.
Houston Business Roundtable
Houston Light & Power Company
H.D. Jacobson Company
J.A. Jones Company
Kaiser Engineers, Inc.
Kellogg Corporation
Koppers Company, Inc.
Liberty Mutual Insurance Company
Limbach Company
LOOP, Inc.

Lummus Company	Southwestern Bell Telephone Company
Charles Maeschers & Company, Inc.	Stanford University
Charles T. Main Company	State of Florida, Department of Education
MDC Systems	State of Ohio, Department of Vocational Education
The Mid-Gulf Business Roundtable	State of Oklahoma, Department of Vocational and Technical Education
Mid-Ohio Valley Industrial Council	Stone & Webster, Inc.
Mobay Chemical Corporation	Structural Systems, Inc.
Mobil Corporation	Sun Company
Monsanto Company	Sun Information Services, Inc.
Nashville Machine Company, Inc.	Swanson-Nunn Electric Company, Inc.
National Constructors Association	Texaco, Inc.
National Vocational Education, Professional Development Consortium	Texas A & M University
New York Telephone Company	Township of Cherry Hill, New Jersey
Owens-Corning Fiberglass Corporation	TRW, Inc.
Pacific Gas & Electric Company	Union Boiler Company
Paison Construction Company	Union Carbide Corporation
Parsons Corporation	Uniroyal Chemical Company
Pennsylvania Power & Light Company	United Engineers & Constructors, Inc.
Pennsylvania State University	United States Steel Corporation
Phillips Petroleum Company	University of Florida
Port Authority of New York and New Jersey	University of Houston
Potomac Electric Power Company	University of Michigan
PPG Industries, Inc.	University of Missouri
Procter & Gamble Company	University of Tennessee
Public Service Company of Indiana	University of Texas
Pullman Kellogg	Urban Investment & Development Company
Rust Engineering Company	Utah Power & Light Company
Sargent Electric Company	Virginia Electric & Power Company
Schai Associates, Inc.	Washington Public Power Supply System
B.F. Shaw Company	H.E. Weise, Inc.
Shell Oil Company	Western Electric
SIP, Inc.	Weyerhaeuser Company
Sordoni Construction Company	H.B. Zachry Company
Southern Bell Telephone & Telegraph Company	

CONSTRUCTION INDUSTRY COST EFFECTIVENESS PROJECT

This Project is a long-range, four-phase effort to develop a comprehensive definition of the fundamental problems in the construction industry and an accompanying program for resolution of those problems leading to an improvement of cost effectiveness in the industry. It is focused primarily on improvement in the industrial, utility, and commercial segments of the industry and has been developed from the point of view of owners or users of construction. Efforts by all segments of the industry, however, are vitally necessary if major improvement is to result.

This report is one of a series of reports from study teams searching individual problem areas. The report series includes:

Project Management — Study Area A

- A-1 Construction Productivity Measurement
- A-2 Construction Labor Motivation
- A-3 Improving Construction Safety Performance
- A-4 First and Second Line Supervisory Training
- A-5 Project Management Education and Academic Relations
- A-6 Application of Modern Management Systems
- A-7 Contractual Arrangements

Construction Technology — Study Area B

- B-1 Integrating Construction Resources and Technology in the Engineering Process
- B-2 Technology Advancement in the Construction Industry
- B-3 Construction Technology Needs and Priorities

Labor Effectiveness — Study Area C

- C-1 Exclusive Jurisdiction in Construction
- C-2 Scheduled Overtime Effect on Construction Projects
- C-3 Contractor Supervision in Unionized Construction
- C-4 Constraints Imposed by Collective Bargaining Agreements
- C-5 Local Labor Practices
- C-6 Absenteeism and Turnover
- C-7 Impact of Local Union Politics

Labor Supply and Training — Study Area D

- D-1 Use of Subjourneymen in the Union Sector
- D-2 Government Limitations on Training Innovations
- D-3 Utilization of Vocational Education in Construction Training
- D-4 Training Problems in Open Shop Construction
- D-5 Labor Supply Information

Regulations and Codes — Study Area E

- E-1 Administration and Enforcement of Building Codes

CONSTRUCTION INDUSTRY COST EFFECTIVENESS PROJECT

This Project is a long-range, four-phase effort to develop a comprehensive definition of the fundamental problems in the construction industry and an accompanying program for resolution of those problems leading to an improvement of cost effectiveness in the industry. It is focused primarily on improvement in the industrial, utility, and commercial segments of the industry and has been developed from the point of view of owners or users of construction. Efforts by all segments of the industry, however, are vitally necessary if major improvement is to result.

This report is one of a series of reports from study teams researching individual problem areas. The report series includes:

Project Management – Study Area A

- A-1 Construction Productivity Measurement
- A-2 Construction Labor Motivation
- A-3 Improving Construction Safety Performance
- A-4 First and Second Line Supervisory Training
- A-5 Project Management Education and Academic Relations
- A-6 Application of Modern Management Systems
- A-7 Contractual Arrangements

Construction Technology – Study Area B

- B-1 Integrating Construction Resources and Technology into the Engineering Process
- B-2 Technology Advancement in the Construction Industry
- B-3 Construction Technology Needs and Priorities

Labor Effectiveness – Study Area C

- C-1 Exclusive Jurisdiction in Construction
- C-2 Scheduled Overtime Effect on Construction Projects
- C-3 Contractor Supervision in Unionized Construction
- C-4 Constraints Imposed by Collective Bargaining Agreements
- C-5 Local Labor Practices
- C-6 Absenteeism and Turnover
- C-7 Impact of Local Union Politics

Labor Supply and Training – Study Area D

- D-1 Use of Subjourneymen in the Union Sector
- D-2 Government Limitations on Training Innovations
- D-3 Utilization of Vocational Education in Construction Training
- D-4 Training Problems in Open Shop Construction
- D-5 Labor Supply Information

Regulations and Codes – Study Area E

- E-1 Administration and Enforcement of Building Codes and Regulations

Summary Report

More Construction for the Money