Reducing Construction Costs: Uses of Best Dispute Resolution Practices by Project Owners, Proceedings Report

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REDUCING CONSTRUCTION COSTS: USES OF BEST DISPUTE RESOLUTION PRACTICES BY PROJECT OWNERS

PROCEEDINGS REPORT

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1
Overview

The construction industry accounts for nearly 8 percent of the gross national product of the United States and directly employs 6 percent of the U.S. workforce (12 percent if the production, hauling, and distribution of equipment and materials for construction are included). Capital projects valued at more than $1 trillion are constructed in the U.S. each year, and American companies build additional projects abroad. The Business Roundtable has called construction a "seminal" industry because the price of every factory, office building, hotel, or power plant that is built affects the prices that must be charged for the goods and services produced in or on it. These prices affect consumers and the ability of U.S. businesses to compete in a global market.

Construction is a high stakes endeavor that produces long-term, unique, and complex building projects and infrastructure. Taking a building project from planning through design, construction, and occupancy involves a diverse array of stakeholders: The project owners, which may be individuals, corporations, or government entities; architects; engineers; general contractors; subcontractors; suppliers; financing institutions; legal representatives; and others. These stakeholders bring varying and sometimes conflicting expectations to a project. They operate in an environment in which their control over a project shifts as the project progresses, and in which there are continual demands to deliver projects in less time and at lower cost.

Given the infinite complexities of delivering a building or infrastructure project, the multiplicity of organizations and individuals involved, and the magnitude of the dollars at risk, it is perhaps not surprising that the construction industry has been characterized by an adversarial operating environment that generates disputes and claims. Serious disputes are estimated to arise in 10 to 30 percent of all construction projects, and one in four construction projects has a claim.

Disputes can arise over schedule targets, performance guarantees, or deviations from the original contract terms. Claims typically fall into two categories: (1) contractor requests for compensation not anticipated in the terms of the original contract, and (2) owner requests for compensation for the contractor's failure to meet contractual terms.

The transactional costs for resolving disputes and claims may total $4 billion to $12 billion or more each year. Direct costs include the fees and expenses paid to lawyers, paralegals, accountants, claims consultants and other experts, and salaries and associated overhead for in-house lawyers and employees who assemble facts, serve as witnesses, and process disputes. Indirect costs include the inefficiencies, delays, and loss of quality that disputes cause to the construction process itself; the lost-opportunity costs of diverting productive employees away from profit-making activities into litigation support; and the costs of fractured relationships between parties who would otherwise profit if they could continue to do business with each other.

Paradoxically, or perhaps because of its adversarial climate, the construction industry has also been a leader in developing innovative tools for preventing, controlling, and efficiently resolving disputes.

PURPOSE OF THE FORUM

The National Academy of Construction (NAC)[1] has determined that disputes, and their accompanying inefficiencies and costs, constitute a significant problem for the industry. In 2002, the NAC assessed the industry's progress in attacking this problem and determined that although the tools, techniques, and processes for preventing and efficiently resolving disputes are already in place, they are not being widely used. In 2003, the NAC helped to persuade the Center for Construction Industry Studies (CCIS) at the University of Texas and the Alfred P. Sloan Foundation to finance and conduct empirical research to develop accurate information about the relative transaction costs of various forms of dispute resolution.

In 2004 the NAC teamed with the Federal Facilities Council (FFC)[2] of the National Research Council to sponsor the "Government/Industry Forum on Reducing Construction Costs: Uses of Best Dispute Resolution Practices by Project Owners." The forum was held on September 23, 2004, at the National Academy of Sciences in Washington, D.C. The forum brought together 16 leading experts (many of them members of the NAC) on the subject of preventing, controlling, and resolving construction disputes (see Appendix A for the forum agenda). The audience included approximately 150 government administrators and private owners of construction projects.

Speakers and panelists at the forum addressed several topics:

- The root causes of disputes and the impact of disputes on project costs and the economics of the construction industry;
- Dispute resolution tools and techniques for preventing, managing, and resolving construction-related disputes;
- Examples of successful uses of dispute resolution tools and techniques on some high-profile projects;
- Ways to encourage greater use of dispute resolution tools throughout the industry; and
- Steps that owners of construction projects (who have the greatest ability to influence how their projects are conducted) should take in order to make their projects more successful.

Neither the forum speakers nor the members of the audience were asked to arrive at a consensus on issues related to dispute resolution practices or to make recommendations. However, there was reasonable consistency among the speakers on virtually all of the topics addressed by the forum. The sections below summarize key points made by various speakers over the course of the forum. Chapters 2 through 10 include detailed summaries of each presentation.

ROOT CAUSES OF DISPUTES

Disputes typically start with a problem and develop into a difference of opinion, which can escalate to disagreements and conflicts that require attorneys and some form of legal action. Root causes of construction disputes identified by the forum speakers included the inequitable allocation of risk

[1] The National Academy of Construction (NAC) is a group of senior construction industry leaders who make themselves available to the nation for advice and service in the interest of improving the construction process. Additional information about the NAC is available from the Secretariat, NAC, c/o Center for Construction Industry Studies, University of Texas, Austin, Tex., 78712-1076 and at http://www.naocon.org.

[2] The Federal Facilities Council (FFC) is a cooperative association of federal agencies having interests and responsibilities related to all aspects of federal facility design, construction, operation, and management. Established in 1953, the FFC operates under the National Research Council, the principal operating agency of the National Academies, congressionally chartered, private, non-profit corporations. Additional information is available at http://www.nationalacademies.org/ffc.

between owners, contractors, and subcontractors; inappropriate contracting strategies; the low bid process; lack of alignment of the owner's, general contractor's and subcontractors' objectives; inadequate owner involvement; poorly developed and executed contracts; poor communication; lack of project management procedures; and fast-track scheduling (Chapters 2, 8, 10).

Of these root causes, research has shown that projects that transfer more risk to the contractor, and projects that use a low-bid process, are significantly more likely to have a claim. One of the principal functions of a contract is to allocate risk among the owner and the contractors. It is not uncommon for owners to attempt to shift project risks to the contractor by adding contract clauses that impose no charges for delays on the part of the owner, or shift the risk of defects in specifications and drawings to the general contractor. In addition, some types of contract strategies, such as lump-sum contracts shift the greatest amount of risk to the contractor (Chapters 7 and 8).

Market forces inherent in the low-bid process can drive the contract price to or below market; thus contractors enter the process driven to find ways to make a profit. Common ways to do this are to identify problems that result in change orders and claims for additional work over and above the original contract scope. These change orders and claims can create turmoil, confusion, problems, and time delays that lead to an adversarial environment. The claims process is not necessarily how contractors want to operate, but it is a function of the low-bid process (Chapter 7). Trust between the owners and contractors cannot be achieved if the allocation of cost and risk is fundamentally flawed (Chapter 7).

Research also indicates that fast-track projects, defined as those with schedules 70 percent faster than the industry average, have significantly more claims than conservatively scheduled projects (Chapter 8).

DISPUTE PREVENTION AND RESOLUTION TOOLS AND TECHNIQUES

Dispute prevention and resolution is about identifying the root causes of conflict and preventing and/or managing conflict with the objective of resolving disputes during the construction process in order to avoid post-construction claims, litigation, and related costs. Traditional principles for managing conflict are intended to resolve disputes quickly and informally, get technical input if necessary, keep the job moving, and avoid the court system (Chapter 2). Because problems and potential disputes can occur in many different ways and at different times during a construction relationship, no one dispute resolution mechanism will fit all problems and disputes. The forum speakers identified numerous techniques and approaches for preventing, controlling, and resolving disputes that can be tailored to specific situations. Benefits from the effective use of dispute resolution tools include: early resolution of disputes; transparent procedures; an operating environment of understanding and cooperation; limited posturing by the various parties; fewer issues and claims; and reduced costs (Chapter 5).

Several forum speakers emphasized that effective dispute prevention begins early, during project planning. It is incumbent on the project owner to acknowledge that problems and disputes will occur and to try to anticipate the kinds of problems and disputes that are most likely to occur. Owners can then design a system of techniques, controls, filters, and devices that will ensure the prompt and realistic resolution of disputes before they fester and grow into serious problems.

During the planning phase, owners can select a contracting strategy for equitably allocating risk and identifying financial incentives so that owner and contractor objectives are aligned. At the same time, the owner can identify techniques to be used throughout the project delivery process to enhance communication, such as integrated project teams, partnering, dispute review boards, employing a project counsel, and others. The Construction Industry Institute has developed a set of best practices and tools that can be used in planning to help prevent disputes (Chapters 3, 4, and 9).

A clear understanding of the scope of work, the labor environment, material availability, and other factors affecting the project prior to the bidding phase can also help avoid or minimize conflicts. It is important to understand site conditions early in the process or, if the conditions are uncertain, to put in place contract provisions that acknowledge and equitably allocate the risk associated with site

uncertainties. Tools such as geotechnical baseline summary reports and escrowed bid documents can be used to address such circumstances (Chapter 3).

Partnering, a team building effort in which the parties establish cooperative working relationships to achieve project goals and resolve potential problems, was highlighted as a particularly effective dispute prevention or resolution technique (Chapters 3, 4, 7, 9, and 10). It was also noted that effective partnering requires fairness from the beginning (Chapter 7).

Arbitration has proven only marginally better than litigation in resolving disputes (Chapters 2 and 9). More effective procedures to manage and resolve disputes include "real time" processes such as negotiation, dispute review boards, or employing a project "neutral" (Chapters 2, 5, 6, and 10).

BEST PRACTICES FOR OWNERS

Several forum speakers stated that project owners need a multi-faceted approach to avoid or resolve disputes and claims. The following best practices for owners were identified:

- Establish a cooperative project environment, with leadership from the top;
- Set up controls that will minimize the frequency and severity of problems;
- Establish real time or jobsite techniques designed to get disputes resolved during construction;
- Use benchmarking and feedback to measure results, improve processes and performance, and build an atmosphere of trust with project participants; and
- Provide for a "backstop" combination of mediation and, as the final resort, arbitration before expert construction industry arbitrators (Chapters 2 and 3).

During the planning phase, owners should:

- Assign project risk to the party that is best able to manage, control, and insure against the risk (Chapters 3, 6, 7, and 9);
- Choose the most appropriate project delivery and management method (Chapters 3, 4, 6, and 8);
- Use a best value approach in bid selection, as opposed to a low bid process (Chapter 7);
- Establish a collaborative team approach;
- Understand and deal realistically with site conditions (Chapters 2 and 3);
- Develop concise specifications and drawings based on national codes (Chapter 7); and
- Use commercial standards to the extent possible because unique requirements discourage firms from bidding on the project (Chapter 7).

During construction, owners should:

- Encourage communication and open sharing of information (Chapters 3, 7, and 8);
- Use functionally integrated owner teams to oversee contractor work and take action when problems arise (Chapters 2, 3, and 4);
- Pay invoices in a timely manner to avoid friction among project participants (Chapter 7);
- Provide adequate authority at the job site so that decisions can be made quickly when something unexpected happens (Chapters 3 and 7); and
- Hold separate meetings to discuss solutions and "who pays" when resolving issues on the critical path (Chapters 3 and 7).

INDIVIDUAL PRESENTATIONS

Chapter 2. "Changing the Adversarial Culture of the Construction Industry and the Business World." Keynote Address by Thomas J. Stipanowich, President and CEO, International Institute for Conflict Prevention and Resolution (CPR Institute). This presentation provides an overview of efforts to address the roots of conflict and strategies for transforming the adversarial cultures of the business world as well as the construction industry. Led by the construction industry, businesses in the United States have moved from litigation to arbitration, from arbitration to mediation, and, more recently, to methods for preventing, controlling, managing and achieving the earliest possible resolution of disputes. In doing so, they have moved the dispute resolution process "upstream" closer to the sources of disputes.

Chapter 3. "Brief Review of Typical Dispute Prevention and Resolution Best Practices." James P. Groton and Robert A. Rubin, Past Presidents of the American College of Construction Lawyers. A summary of innovative tools that the construction industry has developed to prevent, control, manage, and achieve the earliest possible resolution of disputes so that no dispute remains unresolved when a project is completed. Pre-Project Planning Tools prevent problems and lay the groundwork for a project climate that will control disputes. Problem Solving Tools institute processes for resolving disputes at the earliest and lowest project level. Dispute Control Tools level the playing field by encouraging transparency in project relationships. "Real Time" Dispute Resolution Tools establish processes for effectively disposing of disagreements and disputes. Overall Project Organization and Dispute Control and Management Techniques include the design of comprehensive systems and processes to ensure that disputes are managed and controlled and prevented from developing into conflicts that have to be resolved through litigation, arbitration, or mediation.

Chapter 4. "Reducing Construction Costs: Uses of Best Dispute Resolution Practices by Business Owners." Hans Van Winkle, Director, Construction Industry Institute. Through Construction Industry Institute (CII) research and implementation, owners have learned to use "best practices" to enhance project performance. Many of these CII Best Practices are also tools and strategies for conflict management. When used properly, they can help prevent, control, manage, and more quickly resolve disputes, as well as reduce costs and improve quality.

Chapter 5. "Washington Metropolitan Area Transit Authority Successful Uses of Dispute Resolution Best Practices." P. Takis Salpeas, Assistant General Manager, WMATA Capital Projects. The use of dispute resolution boards, partnering, and transparent consensual procedures has brought about earlier resolution of disputes, creation of a climate of understanding and cooperation, a reduced backlog of issues and claims, and cost effectiveness for projects of the Washington Metropolitan Area Transit Authority.

Chapter 6. "Employing Standing Dispute Resolution Panels with the Bridging Method of Design and Construction Procurement." George T. Heery, Architect and President, Brookwood Program Management. One of the best combinations of practices that protect the interests of owners and achieve cost-effective and successful construction projects is the use of the "bridging" method of project delivery together with the use of dispute resolution panels. This presentation describes the "bridging" process, an improvement on traditional design/build construction, whereby the owner employs an architect to complete schematic design and articulate the key design and performance requirements for the project, and then employs a design/build contractor to complete the design and perform construction within the owner's requirements. This system obtains for the owner an early and realistic fixed price contract, net overall construction cost savings, "single point" responsibility for design and construction, and a significant reduction in exposure to disputes and claims. The presentation contains a number of supporting case studies.

Chapter 7. "Risk Allocation: The Pentagon Renovation Project" Andrew Blumenfeld, Chief Counsel, Pentagon Renovation Project. The Pentagon has reorganized its construction renovation effort around the core principle that dispute minimization begins well before the contract is awarded, and that the single most important element of dispute minimization is the equitable distribution of risk. The presentation analyzes in detail the reasons why realistic assignments of risk that reflect the commercial reality of the project (not the relative bargaining power of the owner) are essential to the success of a project. The presentation outlines a series of "Best Practices for General Contractors" and "Best Practices for Project Owners" that are employed on the Pentagon Renovation Project.

Chapter 8. "Current Extent of Use of Dispute Prevention and Early Resolution Practices Among Project Owners: Why Aren't They More Widely Used?" Paul Barshop, Chief Operating Officer, Independent Project Analysis, Inc. This presentation, based on IPA's studies of more than 10,000 projects, reveals that one in four projects has a claim, and addresses the nature of the project environments and risk factors that bear on the sources and size and results of claims. It explores the ways in which risks of claims can be mitigated, the current extent of uses of dispute resolution practices by owners of construction, and inquires why they are not more widely used.

Chapter 9. "Exploring Ways to Encourage and Implement Greater Uses of Dispute Resolution Best Practices." G. Edward Gibson, Director, Center for Construction Industry Studies, University of Texas. This presentation describes research by the Center for Construction Industry Studies into trends in construction claims on projects; investigations into the need for research that would benefit the industry in the areas of economics, finance, and dispute resolution; and the center's ongoing research into the relative transactional costs of various forms of dispute resolution. It also explores ways to encourage and implement greater use of dispute resolution best practices.

Chapter 10. "Getting Beyond Process to the Roots of Litigation: Changing the Litigious Culture in an Organization and Its Impact on the Construction Industry." Lester Edelman, former Chief Counsel, U.S. Army Corps of Engineers. This presentation describes how the U.S. Army Corps of Engineers developed and implemented a dispute resolution strategy that can serve as a model for enabling change in governmental organizations and industry. It describes the implementation of training and development programs to encourage collaborative decision making and enhanced business relationships within an organization, and the type of environment needed to encourage cultural change.

2
Changing the Adversarial Culture of the Construction Industry

Summary of a Presentation by Thomas J. Stipanowich, President and CEO
International Institute for Conflict Prevention and Resolution (CPR Institute)

The construction industry continues to function as a laboratory and proving ground for approaches aimed at avoiding and resolving conflict. Arbitration, once touted as the "end-all, be-all" replacement for litigation, has not fulfilled its promise. Ultimately, like litigation, arbitration is a last resort. Mediation has proven itself to be a much more appropriate and flexible tool for resolution of a wide range of issues and relational dysfunction, and processes such as the dispute resolution board offer the possibility of "real time" dispute resolution. The ongoing quest for more effective methods of managing conflict continues as we focus increasingly on the root causes of conflict and early intervention.

EVOLUTION OF ALTERNATIVE DISPUTE RESOLUTION PRACTICES

Alternative dispute resolution (ADR) continues to gain ground in the business sector, although the picture is very mixed. The 1997 Cornell University/Prevention and Early Resolution of Conflict (PERC) survey of Fortune 1000 Companies was the first major efforts to capture any information about dispute resolution in the business sector. Of the more than 600 survey respondents, the great majority claimed experiences with mediation and arbitration; 87 percent used mediation. However, four out of five respondents said they mediated "only occasionally."

A follow-up study of a small number of companies suggests that major businesses tend to fall into one of three categories when it comes to conflict resolution. A small percentage of businesses tend to rely rather heavily on litigation and reflect a particular propensity to go to court. A minority purport to manage conflict proactively and rely on ADR. The great majority, however, pursue ad-hoc methods of dispute resolution. Many of these companies used dispute resolution tools, but they were doing so with a "litigation mentality."

VARIABLES ENCOURAGING CORPORATE USE OF ADR

A number of external and internal variables encourage corporate use of ADR techniques. External factors include perceived liability risks, the cost of judicial resolution, the regulatory environment, and judicial or administrative encouragement of ADR. Internal factors include supportive leadership, ADR champions, and a corporate culture that espouses experimentation and innovation.

Numerous perceived obstacles to constructive conflict management in companies exist. These include: contentious or competitive corporate cultures; the personal or emotional investment of business managers in disputes; business managers who abdicate their problem-solving responsibilities and pass the problems to their lawyers; lack of supportive leadership; a corporate culture that discourages new solutions; the misalignment of incentives within companies and law firms, including traditional hourly billing arrangements; and a professional legal culture that seeks "perfect" information before deciding how to dispose of a case.

CONSTRUCTION INDUSTRY CHALLENGES

Use of ADR is critical in the construction industry, which is a "crucible of conflict." Construction, which produces long-term, unique, and complex projects, is a high stakes endeavor. Stakeholders have limited control over the job environment and bring varying, and sometimes conflicting, perspectives to each project. Aggressive scheduling further opens the door to problems and disputes.

Traditional principles for managing conflict are to resolve conflicts quickly and informally, get technical input if necessary, keep the job moving, and avoid the court system. Prior to the 1990s, disputing parties would deal face-to-face to resolve a conflict and seek opinions from experts such as design professionals. Binding arbitration was the usual next step.

BINDING ARBITRATION: POSSIBILITIES AND PROBLEMS

According to the Cornell/PERC survey, companies used binding arbitration with the expectation that it would save time, would be more satisfactory than litigation, would involve expert decision makers, and would allow for privacy. It was also perceived that binding arbitration placed limits on liability. However, several concerns act as barriers to the use of arbitration: (1) limited appeal, (2) a perceived propensity of arbitrators to "split the difference," and (3) costs and inefficiencies. Also, disputing parties tend to lack confidence in arbitration because of a lack of qualified arbitrators and uneven administration of the arbitration process. In a 2002 survey of experienced arbitrators in the United States, 31 out of 42 respondents indicated that "arbitration is becoming too much like court litigation and thereby losing its promise of providing an expedited and efficient means of resolving commercial disputes…." On the other hand, a 2004 Corporate Legal Times Survey found that 59 percent of respondents thought that arbitration was less expensive than litigation and 70 percent thought that arbitration was faster than litigation.

According to the Conflict Prevention and Resolution (CPR) Institute Commission on the Future of Arbitration, "choice is the key benefit of arbitration." Arbitration affords the disputing parties flexibility and autonomy in making process choices because the business needs and goals in dispute management vary and arbitration can be tailored to specific needs and goals. However, arbitration, like litigation, should be a last, not first, resort. There are other, better options beginning with face-to-face negotiation. Other options include evaluation, dispute review boards, mediation, and mini-trials.

There is also concern about over-regulation of arbitration processes spreading to the construction industry. For example, a recent modification of the California Arbitration Act (aimed primarily at consumer and employment arbitration) establishes stringent requirements for disclosure of potential conflicts of interest by arbitrators in commercial cases and permits parties to disqualify the arbitrators based on such disclosures within 15 days after receiving the statement of disclosures. A recent court decision states that statutory requirements trump provisions of commercial arbitration rules, which purports to give the California Arbitration Act, or other administering institutions, authority to decide issues relating to arbitrator challenges. Such determinations are making arbitration more problematic for business people in California.

MEDIATION: NON-BINDING SETTLEMENT-ORIENTED APPROACHES

General dissatisfaction with arbitration has spurred a movement to address the root causes of conflict and promote culture change in organizations. The use of mediation as an ADR approach has increased by 10 to 50 percent over the last 3 years, whereas the use of arbitration is static or decreasing.

Mediation is now the most widely used third-party intervention strategy for business conflict resolution because it offers:

- Control,
- Customization,
- Confidentiality,
- Communications,
- Cost savings,
- Creativity in results,
- Continuing relationships, and
- Cultural change.

In the past, companies feared that mediation would be interpreted as a sign of weakness or that it would reveal too much information to the other side. Other fears were that mediation would set a floor on damages, would waste time and money, and could open the floodgates on lawsuits. Finally, there were concerns that if mediation failed once, it would fail again.

Corporate experience with mediation has undermined these myths and fears. According to the 2002 CPR Corporate Survey, most respondents cited settlement rates for mediation in the 80 to 90 percent range. They also reported being highly satisfied with mediation under private auspices, with cost savings averaging $500,000 or more. In contrast, few companies reported more than moderate satisfaction with arbitration and litigation and negligible, if any, savings.

Mediation is most well developed in common law countries including the United States, Canada, Australia, New Zealand, and the United Kingdom. Mediation is beginning to receive attention and some use by businesses in many other places, including the European Union, Eastern Europe, the former Soviet Union, Latin America, the Far East, China, Japan, and India. China, one of the fastest growing economies in the world, has developed a mediation center because it recognizes mediation as an absolute necessity in the modern business world and sees an opportunity to promote international trade and growth; however, it may be some time before mediation in a form recognizable to westerners is a widely used to resolve business disputes.

ELEMENTS OF CORPORATE CONFLICT MANAGEMENT PROGRAMS

In addition to arbitration and mediation, ADR encompasses other innovative strategies, outlined in the 2002 CPR survey of corporate conflict management programs:

- ADR point person and ADR counsel in the organization,
- Participation in the CPR Institute's coalition,
- Negotiation and mediation advocacy training for inside counsel,
- Incentives such as annual performance reviews to encourage attorneys to seek ADR whenever possible,
- Incorporation of ADR in the company's Total Quality Management or Six Sigma Program,
- Early conflict assessment procedures and standardized analysis to guide fact/case investigations,
- Formal decision analysis tools (decision tree),
- Use of ADR Suitability Screen: guidelines in choosing mediation, early evaluation, arbitration, and so forth,
- Pre-dispute contractual provisions for ADR, including carefully drafted provisions for stepped conflict management,
- ADR expectations stated in agreements with outside counsel,
- Alternative billing arrangements,

- Written settlement guidelines for counsel,
- Early settlement or mediation as presumptive processes, and
- Full-scale discovery only with justification.

The CPR Pledge is yet another innovative way to curb litigation. This practice, developed by the CPR Institute, encourages participants to resolve disputes simply and efficiently. More than 800 companies and thousands of subsidiaries, as well as law firms, are parties to some version of this pledge to resolve conflicts out of court when possible.

CHANGING THE CULTURE OF RELATIONAL CONFLICT AVOIDANCE/MANAGEMENT

Businesses have several other options for avoiding and managing conflict on the job. They can allocate risk sensibly and fairly and provide appropriate incentives. They can also tailor a conflict management program to each job.

Partnering and team building are particularly effective for developing successful working relationships. According to an ABA/AGC/DPIC survey from the mid-1990s, contractors and architect-engineering (AE) professionals report more positive experiences with partnering than with mediation, dispute review boards or arbitration (see Figures 2.1 and 2.2).

Successful partnering addresses myriad project concerns:

- Job roles and responsibilities,
- Scheduling and document control,
- Design issues,
- Procurement,
- Construction process,
- Risk allocation and incentives,
- Changes and modifications occurring after project completion, and
- Groundwork for managing conflict through a tailored conflict resolution system.

TEN-STEP MODEL FOR BUSINESSES AND COUNSEL

The CPR 10-step model for avoiding conflicts and managing them is one of the most important tools any organization can use to manage conflict and achieve project goals. It is as follows:

1. Develop corporate policy strategies on avoiding conflict and conflict management, with leadership from the top.
2. Use a collaborative team approach.
3. Demand working knowledge of the full range of conflict resolution tools.
4. Pursue continued collaboration between business managers and house counsel so as not to lose control of projects. House counsel plays a stronger team leadership role with outside counsel.
5. Implement early conflict assessment.
6. Make ADR approaches an integral part of broader company policy.
7. Ensure considered use of mediation, evaluation, arbitration, and so forth.
8. Insist that outside law firms align their practices with corporate goals.
9. Use benchmarking and cost measurements to avoid repeating mistakes and ensure that ADR strategies are working.
10. Emphasize lessons learned and provide feedback to the legal team and to clients.

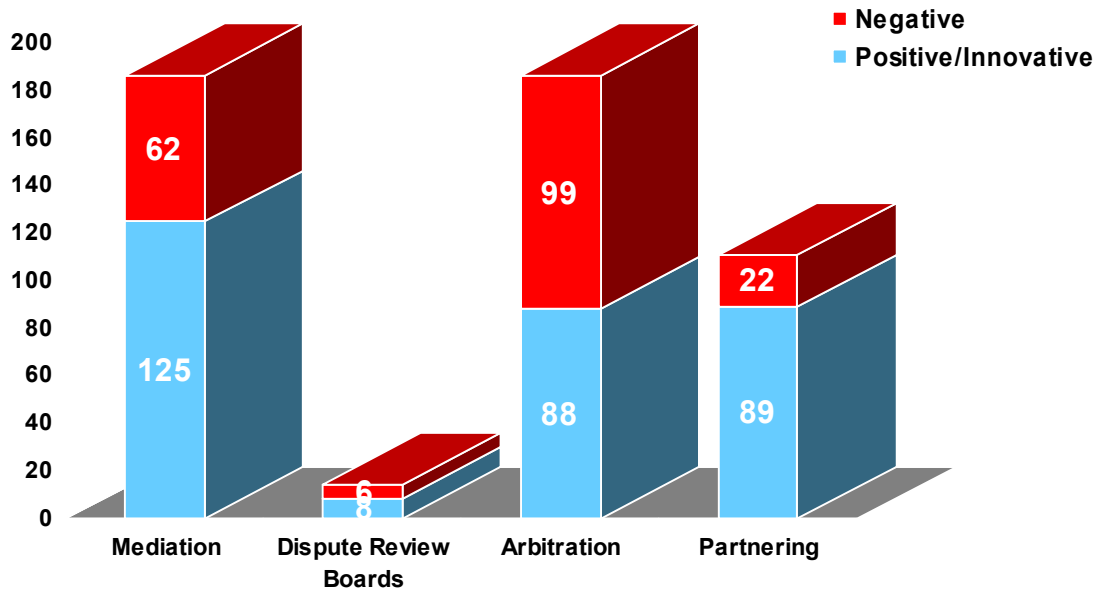

FIGURE 2.1 Reported positive/innovative versus negative experiences of contractors.

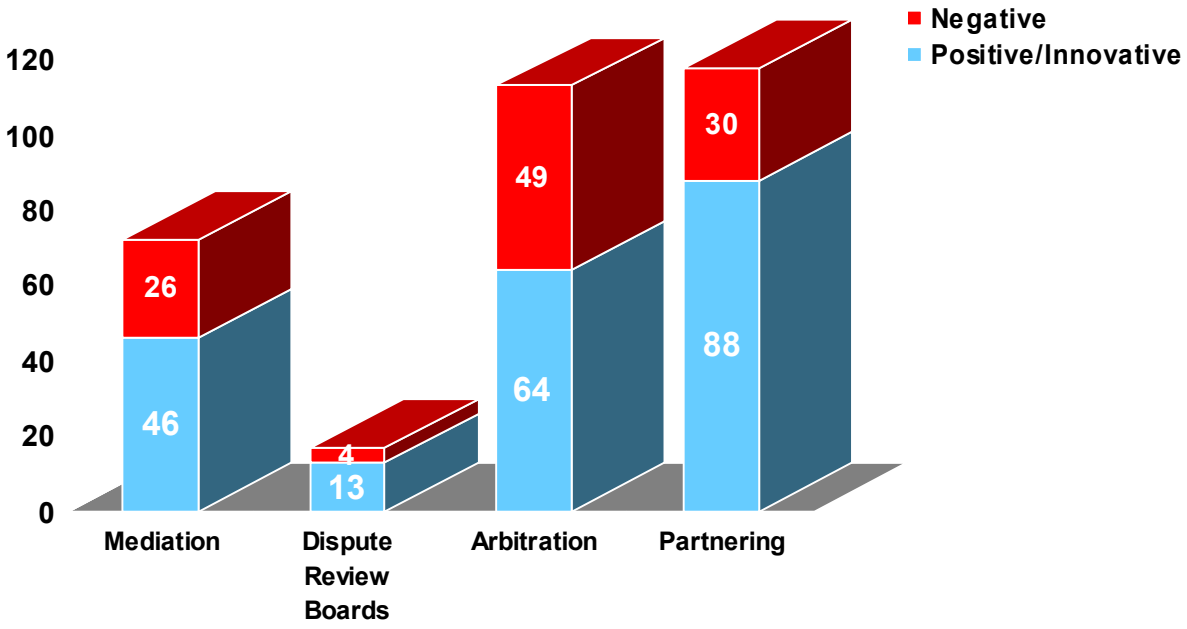

FIGURE 2.2 Reported positive/innovative versus negative experiences of architect-engineering firms.

Benchmarking and feedback are important elements of the 10-point model because they enable organizations to measure results, improve processes and performance, and build an atmosphere of trust with project partners and clients.

FUTURE OF CONFLICT RESOLUTION AND ADR

Dispute resolution is about getting to the root causes of conflict. We can achieve this goal through multidisciplinary approaches and changes in the prevalent culture.

We have not yet achieved our goals because we lack leadership from business and from the legal profession in taking on responsibility for dispute management. There is also fear of change or of taking risks without support from decision makers, and often a lack of time and imagination to break down boundaries between business and law.

The construction industry can be a model for any sector with complex multiparty projects and relationships. A revolution began 20 years ago, but that revolution is still in progress. Businesses must take the lead, but we all have a part to play.

ABOUT THE INSTITUTE

The International Institute for Conflict Prevention and Resolution (CPR), created 25 years ago, is a nonprofit alliance of global corporations, law firms, scholars, and public institutions dedicated to the principles of conflict prevention and "appropriate dispute resolution." CPR helps companies manage conflict and avoid litigation, arbitration, and related risks and high costs. It also seeks to empower the business sector, including the construction industry, to control dispute resolution rather than rely solely on attorneys. CPR, which is gradually expanding its work into Europe, Asia and other parts of the globe, provides three primary services: conferences, workshops and other convening activities; dissemination of information in print, electronic and other forms; and dispute resolution through panels of distinguished neutrals and facilitated negotiation.

RESOURCES

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3
Brief Review of Typical Dispute Prevention and Resolution Best Practices

Summary of a Presentation by James P. Groton
Past President, American College of Construction Lawyers, and
Robert A. Rubin
Past President, American College of Construction Lawyers

Good project managers know how to control costs, schedules, quality, and safety. But often, they do not know how to control disputes. A first step in controlling disputes is for owners and project stakeholders to better understand the nature of the dispute cycle: Disputes start with a problem and develop into a difference of opinion, which can escalate to disagreements, disputes, and conflicts that require attorneys and some form of legal action. Managers must realize they have to break this cycle and resolve problems early.

Our goal in this presentation is to describe a range of best practices, problem solving tools, dispute control tools and "real time" dispute resolution techniques that can be used to break this cycle and help avoid and manage disputes on construction projects.

BEST PRACTICES FOR DISPUTE PREVENTION

Front-end Planning. The Construction Industry Institute (CII) operates on the principle that prevention is the best form of conflict resolution and supports several "best practices" that help reduce problems in projects. CII is a consortium of leading owners, contractors, suppliers, and academics interested in improving the constructed project and the capital investment process. Its mission is to improve the business effectiveness of the capital facilities lifecycle, including safety, quality, schedule, cost, security, reliability and operability. CII offers some of the best pre-project planning and prevention best practices and tools for setting up a project to minimize problems down the line. These include:

- Project Definition Rating Index (PDRI),
- Alignment,
- Constructability,
- Design effectiveness,
- Planning for startup,
- Team building,
- Quality management, and
- Change management.

Additional information about these tools is available at www.construction-institute.org.

Project Delivery Method Selection. One of the most important early steps to prevent disputes is the selection of the most appropriate project delivery and management method. The construction industry has developed many different methods for delivering a project, including traditional design-bid-build, cost-plus, cost-plus subject to a guaranteed maximum price, construction manager at-risk, construction

manager as agent, design/build, bridging with design/build, and so forth. The project delivery method must be chosen with care, depending on the nature of the project. An informed owner will choose the appropriate delivery method at the very beginning of the planning process, perhaps before selecting the project team.

Realistic Risk Allocation. Another best practice for dispute prevention is to assign each project risk to the party who is best able to manage, control, and, if necessary, insure against the risk. Realistic risk allocation is crucial. Saddling project members with risks they cannot handle can build resentment, subjecting the project to adversarial relationships and countless potential disputes.

Financial Incentives to Encourage Cooperation. Project participants must have incentives to form alliances and cooperate. There are a number of cost-effective methods that can help save money and encourage people to work as a team. One example is a "bonus pool," which is divided among all subcontractors (based on their contract amounts), provided they meet defined goals of teamwork and cooperation. The bonus is payable either to everyone or to no one, thus encouraging the participants to support and assist each other by focusing on legitimate project goals and subordinating self-interest to the ultimate benefit of all project participants.

Predicting the Likelihood of Disputes. At the beginning of a project, participants must recognize that disputes and problems can arise even in the best of circumstances and should plan accordingly. CII has developed a tool called the "Disputes Potential Index." If administered at the beginning of the project, project leaders can take corrective actions in vulnerable areas to minimize the risk of disputes.

Partnering. This is a team-building effort in which the parties establish cooperative working relationships to achieve project goals and resolve potential problems. It can be used for long-term relationships or on a project-specific basis.

PROBLEM SOLVING TOOLS

Negotiation. Negotiation is the time-honored method of discussing problems and resolving them consensually by focusing on the legitimate interests of both parties. The focus is first on getting the problem solved so that the project can move ahead. The focus should be on "First, let's fix the problem," rather than "First, let's fix the blame."

Step Negotiations. In recent years, construction documents have incorporated step negotiation, a progressive process for dealing with problems. Step negotiation aims to resolve problems at the jobsite level. But, if the jobsite representatives are unable to resolve the issue, it is passed to their immediate superiors, who are not as closely involved with the problem. If they fail, the problem will be passed up to the senior management of both parties. Because of an intermediate manager's detachment and interest in demonstrating to higher management the intermediate manager's ability to solve problems, there is a built-in incentive to resolve disputes before they go to the higher level. Step negotiation has proven particularly effective in resolving disputes early and preventing them from escalating.

DISPUTE CONTROL TOOLS

There are a number of techniques for creating a level playing field and an environment that tends to reduce the likelihood of disputes:

Encourage Communication and Open Sharing of Information. If all parties are communicating and sharing the same information about the project, in effect being "all on the same page," they have the same tools to work with and less chance of misunderstanding each other. Such an approach tends to create trusting relationships.

Geotechnical Baseline Summary Report. Contract and bidding documents typically include the results of a geotechnical investigation. The investigation includes logs with descriptions of the material, the elevation at which water is found, the elevation at which rock is found, and notations about the types of soil and rock encountered. However these reports rarely include interpretive notations to help contractors develop their bids. Where a project may encounter unanticipated geotechnical conditions, it is useful to establish, at the time of contracting, a geotechnical "baseline" of expected underground conditions, from which any changed conditions can be measured, with price adjustments at pre-agreed unit rates.

Engineers who preside over geotechnical investigations use the report to state the conditions that contractors can expect: Obstructions to the pile driver, the number of boulders, the likely elevation at which the piles will rest, the projected inflow of water that will have to be addressed in dewatering the site during construction, and other such information.

This type of geotechnical report, coupled with the site conditions clause, aims to reduce the risk factors in the contractor's evaluation of the project for bidding. It also results in more uniform bid prices, less exposure to claims involving interpretation of subsurface data, and a transparent non-controversial changes procedure which should foster a climate of openness and candor.

To date, the Geotechnical Baseline Summary Report has not been widely used because geotechnical engineers worry about liability for professional negligence. It is finally gaining greater acceptance because the frequency of claims against engineers who use this device has been considerably less than expected.

Escrowed Bid Documents. In spite of its benefits and successes, the Geotechnical Baseline Summary Report still gives rise to concerns that contractors are making a windfall on projects. Escrowed bid documents were designed to alleviate such mistrust. Because of the likelihood of changes to any construction project and the need to obtain the most reliable pricing for changes, it is often helpful to place the successful bidder's estimating calculations in escrow. The calculations can then be consulted whenever a dispute arises that requires reference to the original quantity and price calculations. This method also fosters a climate of openness and candor in a project and has proven successful in reducing the likelihood that a claim for compensation will be disputed.

REAL TIME DISPUTE RESOLUTION AT THE JOB SITE

Dispute Review Boards. For real-time dispute resolution at the project site, the traditional approach has been to call on the project's designer to make rulings on questions of compliance with the contract requirements and workmanship. These decisions, while not binding on the parties, can often help resolve problems in the field promptly. However, a more modern and much more successful alternative is the Dispute Review Board (DRB). Dispute Review Boards emerged in the mid-1970s and have been used in approximately 1,100 projects worldwide (about $79 billion worth of construction).

At the outset of a project, the contractor and owner mutually choose one or three neutral construction experts, who are asked to become generally familiar with the project and its progress, and be available to render advisory decisions promptly on any problems that the parties are unable to resolve themselves. These experts serve for the duration of the project and hold regular meetings at the project site to receive progress updates. If disputes occur, the DRB can convene quickly to hold a hearing and give a non-binding written recommendation. This system works because it is non-threatening and allows parties to retain control of the process. The existence and ready availability of trusted expert neutrals who have been chosen by and have the confidence of the parties, and the knowledge that, if asked, they

will render objective decisions which will administer "a dose of reality" to the parties, has many advantages in encouraging the parties to resolve disputes promptly. This process has enjoyed great success in both preventing disputes and achieving early consensus on virtually every project in which it has been used.

In the 1,100 projects that have used DRBs, participants adopted 98 percent of the boards' recommendations and ended disputes without mediation, arbitration, or litigation. The cost of a DRB is typically 0.15 percent of the total cost of construction—far less than the cost of resolving any dispute through arbitration or litigation. The existence of a pre-selected neutral agent chosen by and respected by the parties, who is already familiar with the project and its progress, avoids many of the initial problems and delays that are involved in selecting and appointing neutral agents after a controversy has arisen. The ready availability of the neutral agent, the speed with which he or she can render decisions, and particularly the fact that this neutral will hear every dispute which occurs during the life of the relationship, all provide powerful incentives for the parties to deal with each other and the neutral in a timely and frank manner, by discouraging game-playing, dilatory tactics, and the taking of extreme and insupportable positions. In practice, the nature of this process is such that the mere existence of the neutral agent always results in minimizing—and often totally eliminating—the number of disputes that have to be presented. In effect the use of a standing neutral serves not only as a standby dispute *resolution* technique, but also as a remarkably successful dispute *prevention* device. Even though some expense is involved in selecting, appointing, orienting, and periodically keeping the neutral informed about the relationship, the costs are relatively minimal, even in those rare cases where the neutral has to be called on to resolve disputes—especially when compared to the potential costs of resolving a dispute in arbitration or litigation.

Two variations of the DRB are the standing arbitrator panel and the standing mediator, where a mediator or one or more arbitrators is designated at the beginning of the project to either mediate or render binding decisions promptly on problems that the parties are unable to resolve themselves.

Designating a standing mediator when the project begins is a rarely-used technique. This is probably because what the parties need during construction is not a facilitator to encourage them to compromise every dispute, but rather an objective expert such as a DRB who can administer a "dose of reality," a process that is more likely to give the parties a principled basis for resolving disputes. A standing arbitrator is much less successful than a DRB because the binding nature of the arbitration process takes away the ability of the parties to mutually resolve the dispute and almost invariably causes the parties to involve lawyers, thus adding expense, polarizing positions, and escalating adversarial attitudes.

Employing a Project Neutral. On some large, complex, many-phase construction projects involving many different parties over a long period of time, it has been useful to employ a full-time neutral expert in both construction and dispute resolution. His or her role is to continuously monitor the project to make sure that all of its dispute prevention, control, and resolution mechanisms are operating well. If they are not, the project neutral can recommend other techniques that will make it certain that all disputes are successfully resolved.

Designating a Project Counsel. On large projects that may involve complex legal relationships and questions, the project can be well served if all of the parties collectively select and employ an expert construction lawyer who would be the legal advisor for, and represent, the "project" as a whole, not any individual party. The tasks of project counsel would be the following:

- Help the parties to select the most appropriate project delivery system,
- Assure that all contracts and insurance arrangements on the project are consistent with each other and integrated,
- Participate in team building processes,

- Work with the parties to design project-wide systems for dispute prevention, control, and resolution, and
- Guide the project through the complex legal relationships between the parties.

Project Alliancing. The project is structured to align the commercial interests of all the parties, so that they share risks and rewards equitably. Alliancing provides incentives to the parties to work cooperatively and openly, to perform well—even exceptionally, and to align attitudinal objectives to create mutual commitment, trust, openness, flexibility, and teamwork.

SUMMARY

There are many techniques and approaches to preventing, controlling, and resolving disputes. Because problems and potential disputes can occur in many different ways and at different times during a construction relationship, no one size of dispute resolution mechanism fits all problems and disputes. Therefore, at the beginning of a construction relationship, the most successful approach is to acknowledge that problems and disputes will occur, anticipate the kinds of problems and disputes that are most likely to occur, and design a system of techniques, controls, filters, and devices that will ensure the prompt, realistic resolution of disputes before they fester and grow into serious problems. A typical "stepped" approach would be for the parties to design a system that will (1) establish a cooperative project environment, (2) set up controls that will minimize the frequency and severity of problems, and (3) establish real time or jobsite techniques designed to get disputes resolved during construction. In the unlikely event that these techniques do not resolve all problems, provide for a "backstop" combination of mediation and, as the final resort, arbitration before expert construction industry arbitrators.

4
Use of Best Practices in Construction

Summary of a Presentation by Hans Van Winkle
Director, Construction Industry Institute

The Construction Industry Institute (CII) is a consortium of leading owners, contractors, suppliers, and academia interested in improving the constructed project and the capital investment process. CII's mission is to improve the business effectiveness of the capital facilities lifecycle, including safety, quality, schedule, cost, security, reliability and operability. CII meets its mission by gathering owners, contractors, the supply chain, and the best minds in the academic world to solve problems in the construction industry, including dispute resolution.

CII defines a best practice as a process or method that, when executed effectively, leads to enhanced project performance. To qualify, a practice must be sufficiently proven through extensive industry use and/or validation.

Traditional tactics will not solve the disputes of modern business. In the construction industry, organizations have begun adopting best practices, including dispute resolution, with good results. Furthermore, industry data indicate that those who use best practices reduce the potential for conflict, improve safety and business practices, and develop better project relationships. Approaches such as partnering, dispute resolution boards, and mediation are more relevant and thus part of the CII philosophy.

In pursuing its mission, CII has developed many best practices, including:

- Pre-project planning,
- Alignment,
- Constructability,
- Design effectiveness,
- Materials management,
- Team building,
- Planning for start-up,
- Partnering,
- Quality management,
- Change management,
- Disputes resolution,
- Zero accidents techniques,
- Implementation of products,
- Benchmarking, and
- Project delivery method and contracting strategy.

If a project is conceived from the beginning with these best practices in mind, then the need for dispute resolution may be minimized or avoided altogether. The most valuable best practices are those that prevent or resolve disputes as early as possible at the project level and under the control of those directly involved.

CII's best practices have had beneficial results for CII members and others in terms of safety, cost, and schedule. Indeed, safety has been a signature issue for CII. Safety on the jobsite is important in and of itself but also because it affects other areas such as project performance, workforce development and acquisition. CII member companies that use best practice approaches for safety fare almost seven times better than non-member companies.

Project schedule data are less conclusive and more difficult to define. The CII database indicates that best practices produce fewer results for project schedule than for other parameters. This is an issue because schedule is becoming increasingly important. Companies are under increasing pressure to produce new products, modify existing ones, and develop new processes faster than ever, all of which affect project schedules.

Saudi Aramco is a good model for how best practices produce good results. The company claims to have saved more than $500 million in 2002 at their Herod Gas Plant by incorporating best practices. They achieved such results by dedicating staff to explore the best practices of CII and other organizations and by adapting these to their industry.

It is important to educate the construction industry about the benefits of best practices. To this end, CII has an active program to help members deal with issues such as risk allocation, contracting strategy, and benchmarking. Also, good pre-project planning and good procedures and processes will diminish opportunities for disputes.

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5
Washington Metropolitan Area Transit Authority Successful Uses of Dispute Resolution Best Practices

Summary of a Presentation by P. Takis Salpeas
Assistant General Manager, WMATA Capital Projects

The Washington Metropolitan Area Transit Authority's (WMATA's) Metrorail system is a landmark in civil engineering history, one of 40 "Projects of the Century" recognized in November 2002 by the American Society of Civil Engineers. Among its peer projects in national infrastructure are the Hoover Dam, the Panama Canal, the Empire State Building, the Brooklyn and Golden Gate Bridges, and the Erie Canal. This project, constructed in three phases, encompassing 103 miles of track and 83 stations throughout the Washington, D.C., metropolitan region, cost $18 billion (in 2002 dollars). WMATA is the only public agency in the United States with a Board of Directors from three jurisdictions (Virginia, Maryland, and the District of Columbia).

To build this system, the agency awarded more than 350 major prime contracts using the design/bid/build project delivery system and a sealed/low bid procurement method. Only one design-build/best value contract was awarded for building the last of the eight rail car maintenance and storage facilities for the 103-mile system on the Green Line (at a cost of $125 million).

With three decades of phased projects, the WMATA system represents the largest underground construction project undertaken since World War II. The first phase had 90 million constructor labor hours; the second phase, 24 million; and the third phase, 18 million. The typical WMATA project was prone to conflict due to the complexity of the projects and the involvement of at least 20 prime contractors.

As early as 1971, WMATA's Board of Directors decided that the policy of WMATA, in the interest of timely and economical resolution of contractual disputes, would be to provide for an administrative appeal from adverse decisions of the contracting officer. The original policy, seen as the most timely and economical, was to resolve construction disputes through an established board of contract appeals. The U.S. Army Corps of Engineers Board of Contract Appeals (ENG BCA) was the first board used, and after a merger in 2000, the Armed Services Board of Contract Appeals (ASBCA) replaced ENG BCA.

DISPUTE RESOLUTION EXPERIENCE

Prior to using dispute resolution boards (DRBs) and partnering, changes were not priced until the work was long completed. Changes were based on costs incurred, and the parties were required to devote substantial resources to resolving numerous outstanding charges and claims, thereby increasing costs and delaying payments. The contracting officer was responsible for final decisions on disputes, and hundreds of final decisions were issued. Sometimes claims were denied because contractors failed to submit all of the required information.

By 1985, WMATA had 350 cases before the Army Corps of Engineers Board of Appeals, and the average resolution time was five years beyond contract completion. As a result of delays in resolving

change orders, contractors either gave less competitive bids or did not bid at all. The disputes began accumulating and draining a significant amount of resources. Payment processing often required a great deal of administrative support—lawyers, auditors, procurement people, and other support departments. Costs escalated, and sometimes it took years to resolve the more complex disputes.

WMATA's initial efforts to research alternative methods for resolving claims began in 1985 with draft contract provisions for a mini-trial. The effort was inspired in part by the success of the Army Corp of Engineers' mini-trial procedures and WMATA's desire to find an alternative to the ENG BCA process. WMATA's real success with dispute resolution came in 1992, after the federal government enacted the alternate dispute resolution (ADR) law (Public Laws 101-552; 102-354). The agency had several champions at different levels to further advance the use of ADR and convince the WMATA Board of Directors to give the new process a chance to reduce the backlog of cases. The following anticipated benefits were a motivating factor:

- Early resolution of disputes,
- A climate of understanding and environment of cooperation between the parties,
- A reduced backlog of issues and claims,
- Limited posturing by the parties,
- Simple, transparent, consensual procedures, and
- Cost effectiveness.

Former and current directors of WMATA's Office of Construction led the effort to establish DRB and partnering provisions that have been part of all major construction contracts since 1993. Most recently, management has encouraged the expansion of dispute resolution to include mediation, in addition to the current DRB process. Project managers are asked to recommend the dispute method that is most advantageous to their contracting process and specific project.

Acceptance of the use of ADR techniques did not come easily. Initially the general counsel's office did not support the process because of concerns that DRBs would favor contractors or "split the difference" in resolving claims, and that WMATA would be required to pay uncalled-for sums of money for resolution. However, WMATA's top management pushed for and supported ADR, which made change ultimately possible.

USE OF DISPUTE RESOLUTION BOARDS

The addition of a DRB and partnering in contracts affords the parties an opportunity to solve issues during contract performance rather than after completion. Depending on the complexity of the contract, contractors and project teams receive a briefing to better understand the situation. If an issue emerges, project participants are all aware of what is happening and are in a position to help resolve the issue quickly and effectively. A DRB is especially effective in disputes over the merits of a claim because a neutral party can influence and guide both sides toward a mutually acceptable resolution. In a high-profile situation where public money is involved, it is important to resolve not only the issue, but also the appearance of conflict to avoid negative publicity.

A recent major tunneling project illustrates the effectiveness of using a DRB. In this case, a contractor claimed a differing site condition. The issue was brought immediately before the DRB, which concurred that there was a differing site condition. Based on this decision, WMATA and the contractor negotiated a modification for extra work, and the contractor finished the work without a claim. By resolving this issue early, the parties removed the uncertainty regarding responsibility, and the work progressed with a clear understanding of which party was responsible for the additional costs. WMATA has used these techniques on all major projects (more than $20 million) and all at-risk projects.

In a similar case, a contractor bypassed the DRB hoping to get full relief through the courts. He lost in front of a jury, appealed, lost the appeal, and petitioned the Supreme Court only to have his appeal

finally denied. This contractor did not want to use the DRB or pursue partnering, and, as result, lost a lot of time and money.

In complex projects, it is helpful to establish clear roles, responsibility, and accountability. When these elements are missing, it is easy to have problems or misunderstandings. For example, in one particular WMATA project, a major technology contract was awarded that did not make provisions for a DRB because it was a "Supply and Services" contract rather than a "Construction Form" contract. Four years into the job, there were many unresolved issues and the working relationship was not good. To avoid escalation of adversarial behavior, the contractor and WMATA agreed to include post-award DRB provisions in the contract. A better situation would have resulted if DRB provisions had been included in the original contract.

WMATA does use traditional DRB formula exceptions. WMATA contracting officers can keep the DRB from hearing "precedent setting" issues. WMATA will not take policy matters with broader implications to the DRB for resolution (e.g., third party interference, the use of the Eichlay formula for calculating overhead).

Once the dispute goes to the DRB, the contracting officer must accept or reject the DRB decision within 30 days. This is considered a "final decision" and can be appealed under the Disputes Clause to the Armed Services Board of Contract Appeals (ASBCA). The DRB decision can be considered as part of any subsequent appeal or litigation, but is not binding. WMATA has not litigated a DRB decision, so there is some uncertainty about how a Board of Contract Appeals might treat a DRB decision.

When determining whether to use arbitration or litigation, WMATA follows the federal model: If a dispute is not resolved by the DRB, the contractor may request a final decision from the contracting officer. The final decision may be appealed to the ASBCA, which will render a written decision. The decision of the ASBCA may, in turn, be appealed to any court of competent jurisdiction (state and federal courts of D.C., Maryland, and Virginia) under the Wunderlich Standard. Under Wunderlich, the court's review is limited to determining whether the decision is "fraudulent or capricious or arbitrary or so grossly erroneous as to necessarily imply bad faith, or is not supported by substantial evidence."

In summary, a DRB is necessary for any organization that undertakes major construction with major contractors in a complex environment. In general, DRBs and ADR are used to reduce conflict and produce quality projects.

6
Employing Standing Dispute Resolution Panels with the Bridging Method of Design and Construction Procurement

Summary of a Presentation by George T. Heery
Architect and President, Brookwood Program Management

Brookwood Program Management is involved in the design and construction of buildings, as opposed to large infrastructure projects. Our largest project has been about $300 million. For all of our projects, whatever the project delivery method, we include a standing dispute resolution panel in our contracts, similar to the Dispute Review Board that has been previously described. My comments focus primarily on methods to protect the interests of the owners of building projects ranging in value from $10 million to $300 million, such as the one shown in Figure 6.1.

In construction procurement, before selecting the project delivery method, an architect, or engineers, it is important to clarify the owner's "posture" or "purchasing instruction." Most owners fall into one of two categories: (1) those who can prudently rely on relationships with contractors in buying and designing construction and (2) those who cannot or should not rely on these relationships. Companies or owners, such as Walmart, that are repeatedly constructing the same projects can establish relationships with a few contractors and prudently rely on them to control projects, cost, and quality. On the other hand, public sector owners and many major corporations who construct more varied projects are headed for trouble if they rely on relationships. My focus is on procedures specifically for those owners who cannot and should not rely on relationships to produce a quality project.

Figure 6.2 illustrates the basic phases of design and construction: schematic design (SD); design development (DD); preparation of the contract documents, consisting of the working drawings and specifications (CD); the bidding or negotiation and awarding of the construction contract; and then the construction. There are four parties involved in this process: the owner, the owner's architect or design consultant, the construction contractor, and the program manager (which may be an internal or an external program management group).

A traditional method for design and construction procurement, where acquisition of the project site, site analysis, the development of program requirements, receipt of planning approvals, and selection of an architect take place before schematic design, has four fundamental flaws. First, this system takes too long and, from the owner's perspective, costs too much before a fixed price is established. For example, a $50 million classroom building project may take 18-24 months and cost $2 million before a fixed price is established. The owner is at risk during this entire time.

The second flaw is to assume that architects and engineers know the most about construction technology and practical, cost-effective, construction methods. Actually, that level of knowledge is in the purview of specialty subcontractors and building product manufacturers.

The third flaw is that virtually all construction contracts that are prepared for a lump-sum bid are based on the assumption that the contract documents are free of errors and omissions. Developing error-free contract documents is virtually impossible.

FIGURE 6.1 Typical projects.

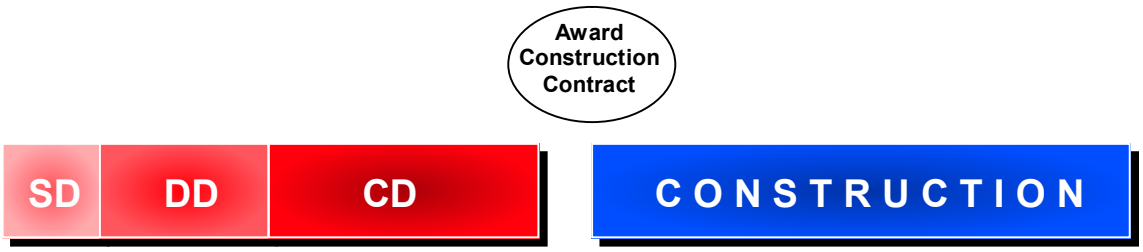


FIGURE 6.2 Basic phases of design and construction.

The fourth fundamental flaw is that responsibility for the project is divided among the owner, designers, contractors, and program manager. Not having a single point of responsibility can lead to finger-pointing when problems arise. Typically, the owner will find it difficult to resolve issues and has to step in and pay some or all of the costs involved in fixing the problem.

An alternative to the traditional method of design and construction procurement is the design/build method. One advantage that the design/build method has over the traditional design-bid-build process is that design/build integrates construction knowledge into the design process. It also provides a single point of responsibility for post-construction problems. Design/build, however, has its disadvantages. A typical design/build contract has an inherent conflict of interest between the owner and

the architect-engineering (A/E) team. It can be difficult for the owner to obtain "apples-to-apples" prices among the competing bidders for a project. The owner only has three tools to control a project: competition; contract documents, and the purse strings. In my opinion, competition is the most valuable and the least appreciated of those tools.

A method called "bridging" can be used to resolve these issues. Bridging was created to improve on design/build and provide benefits to the project owner. In bridging, the owner's architect or design consultant and the program manager work in the traditional way with the owner to complete the schematic design. After the design is reviewed and approved, the contract documents are prepared for a design-build form of contract, and the owner issues a request for proposals (RFP) which consists of the form of agreement between the owner and the contractor and the typical bid documents.

In a typical design/build project, the design is about 45 percent complete at the design development stage, while engineering might be 25 percent complete. In most projects that use bridging, the design is 60 to 70 percent complete, while the engineering is only about 10 percent complete.

The advantage of bridging is that it allows the owner to tie down every part of the design that needs to be tied down before the RFP is issued, and leave other items open. For example, the bid documents might include the performance specifications and requirements related to the foundation of the building so that the owner's representatives can review contractors' bids and compliance with codes, but not include the actual design plans for the foundation. Or, if there are very specific requirements, such as a gold doorknob with the director's initials in it, or detailed cabinet work, the owner would include those specific designs in the contract bid documents. Under bridging, the owner will invest about the same number of hours and effort that would typically go into a traditional design development. However, the design is more complete while the engineering is less complete. The owner is then in position to take proposals for design-build even though the majority of the design has been completed.

Bridging has a two-step award process (Figure 6.3). The first step for the design/build contractor is to complete the construction documents, i.e., complete drawings and specifications used for both building permitting and construction. According to the bridging contract, the owner is entitled to everything stated in the design development/RFP contract documents and in the construction documents. In case of a conflict, the contract documents prevail.

When and if the owner wants to proceed with the project, the authorization for construction is given. This is the second step in the award process.

During the construction phase, the program manager and the owner's design consultant (who is completely separate from the design-build contractor's A/E) carry out construction in the standard fashion.

Bridging provides a number of benefits to the project owner:

- A more enforceable fixed price contract obtained in about half the time and at about half the front-end cost compared to any other method that truly provides an enforceable price contract;
- Net overall construction cost savings for an equal product, typically in the 5 to 10 percent range;
- Significant reduction in exposure to claims and unexpected change orders not requested by the owner; and
- Clear and single responsibility for correcting post-construction problems and glitches.

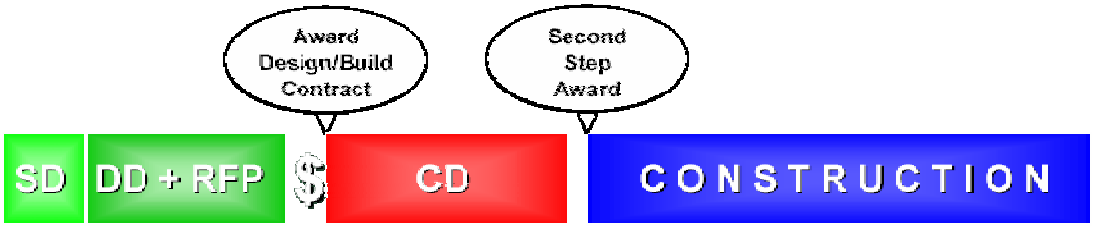


FIGURE 6.3 Bridging method.

CASE STUDIES EMPLOYING BRIDGING AND A STANDING DISPUTE RESOLUTION PANEL

Three bridging projects recently completed by Brookwood Program Management illustrate how bridging and use of a standing dispute resolution panel can help owners to save time and money and avoid disputes and change orders (see Table 6.1).

According to the statistics collected for the Georgia Institute of Technology project, only the pre-design schedule changed during the process. Actual completion and beneficial occupancy was one month ahead of schedule. The total time for final design and construction was 19 months. The actual cost was lower than anticipated, and the resulting $100,000 surplus enabled Georgia Tech to get the extras it wanted and contribute to a bond retirement reserve. There were no contractor-initiated change orders and no claims against the owner.

The Morehouse College Student Housing project finished 1 month ahead of schedule and the actual costs came in under budget. Morehouse used the $915,000 surplus to buy additional items for the activity rooms, the study carrels, and other spaces. There was only one contractor-initiated change order due to unusual weather conditions. However, there were no claims against the owner and no additional costs to correct post-construction problems.

The Georgia State University project finished one month ahead of schedule after 23 months of design and construction time. There were no contract-initiated change orders or claims against the owner.

All three of these projects show how bridging can benefit owners by significantly reducing risk and post-construction problems and enabling greater savings and scheduling efficiency. In all cases, bridging was combined with a standing dispute resolution panel requirement. However, the dispute resolution panel can be used effectively regardless of the chosen delivery method.

RESOURCES

Brookwood Program Management Publications. Available online at www.brookwoodpm.com.
Terry, J., and K. Hebblethwaite. The Bridging Method. Available online at www.ediltd.com/html/the_bridging_method.html.

TABLE 6.1

	Georgia Institute of Technology	Morehouse College Student Housing	Georgia State University High-Rise Graduate Student Housing
Pre-design schedule for completion (full beneficial occupancy	September 2003	September 2003	August 2002
Actual completion for full beneficial occupancy	August 2003	August 2003	July 2002
Total time of final design and construction	19 months	19 months	23 months
Pre-design total project budget (hard/soft costs with site work)	$21,155,860	$20,735,000	$32,013,936
Actual total funds utilized (hard/soft costs with site work)	$19,643,685	$17,287,860	$29,604,365
Total project cost per "bed"	—	$36,362[a]	$64,919[b]
Total project cost per square foot of gross floor area (including site work)	$148	$90.50	$120
"Dividend" funds within budget made available to user	$100,000	$915,000	$608,070
Owner/user initiated change orders as percent of total project budget	0.04	2.7	3.3
Total number of contractor initiated change orders	0	1	0
Total cost of contractor initiated change orders	$0	$63,740	$0
Total number of claims against owner/user	0	0	0
Cost to owner of post construction problems	$0	$0	$0

[a]400 square foot per "bed."
[b]532 square foot per "bed."

7
Risk Allocation: The Pentagon Renovation Project

Summary of a Presentation by Andrew Blumenfeld
Chief Counsel, Pentagon Renovation Project

Conceptually, the renovation of the Pentagon is best viewed as urban renewal in a decayed rust belt city. This particular city has three defining characteristics: its size; the diversity of purposes it serves; and the extent of deterioration.

The Pentagon is a fairly self-sufficient complex that houses everything from bagel kiosks to extremely sensitive military command centers and everything in between. There is a fire department, a police department, shopping, and myriad other spaces and functions (Figure 7.1).

Prior to 1998, the renovation of the Pentagon was being overseen by 5 separate organizations in 2 agencies. No one entity was in charge of the overall success of the project, although different agencies were responsible for individual elements, creating an environment of fragmented authority and decision making, leading to ineffective project execution. As a result, there was an inability to control changes to the project scope of work. There were numerous modifications very late in the design and construction process, which prevented the general contractor from operating efficiently. Projects were coming in 50, 60, or 70 percent over budget and well behind schedule. The entire renovation was on the verge of being cancelled.

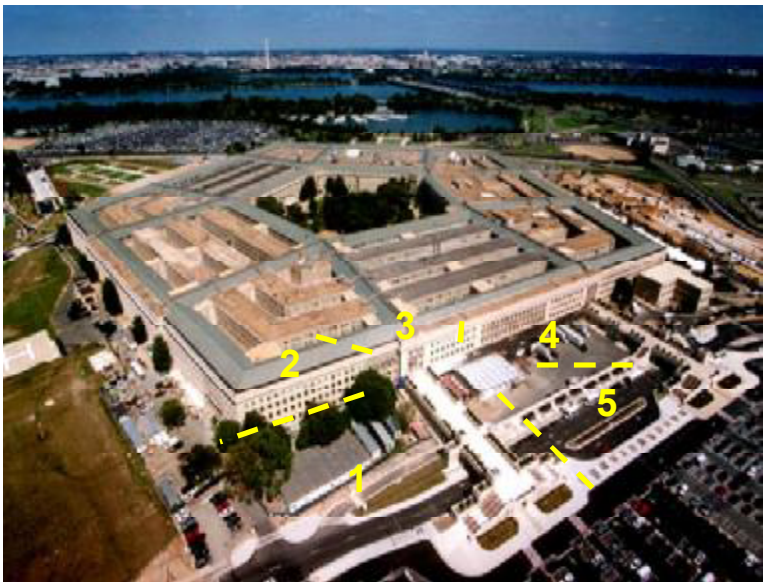
Department of Defense decision makers recognized these problems and restructured program responsibility, in both function and reporting. A single program manager was given the authority and resources to manage the project.

The program manager initiated significant changes in job management and operations. A switch was made from a design/bid/build to a design/build project delivery system. Concurrently, the solicitation approach was changed from a low bid to a best value process. The use of prescriptive, detailed specification contracts was abandoned in favor of performance requirements-based contracts. The staff was reorganized from a "stove piped" or individual discipline approach to an integrated project team. More communication with senior leaders in the Pentagon was instituted. As a result, the situation improved significantly and projects are routinely under budget and ahead of schedule.

The Pentagon, more than 60 years old, is only now being renovated. All major building systems are well beyond their design lifetimes and are beyond repair. The building has hazardous materials present throughout, does not meet modern building code requirements, and is far from being energy efficient (Figure 7.2).

PENTAGON RENOVATION ACQUISITION SYSTEM

The Pentagon moved away from using a low bid process for several reasons. First, low bid is inappropriate in situations with many unknowns, certainly the case at the Pentagon. Second, market forces inherent in the low bid process drive the contract price to the cost of performance or below it. The contractors enter the process driven to find ways to make a profit. A common practice is for



34 acres
6.5 million sq. ft.
3 Empire State Bldgs.
7,748 windows
17.5 miles of corridors
25,000 personnel
1,000,000 calls each day
Police force
Metro station
Fire Station
Health Facilities
Post Office

FIGURE 7.1 The Pentagon, a small city.

FIGURE 7.2 The need for renovation.

contractors to identify problems that will result in change orders and claims in order to drive additional work over the original contract. Thus, turmoil, confusion, problems, and time delays can serve to increase profits for the contractors. In this type of operating environment, contractors enter the process as adversaries. Employing this practice is not necessarily how the contractors would like to work, but is seen as a way to make a profit in a project with a low bid process. Third, the low bid method deters some of the best firms from competing for the work, particularly given associated federal reporting requirements, cost accounting standards, and other issues.

The new Pentagon renovation acquisition system is a two-phased, best value process. In the first phase (initial down-select), any interested firm can respond to the request for proposals (RFP) by submitting a summary of their experience with similar work and sufficient information to allow for extensive reference verification for both design and construction work. This phase progresses quickly and allows contractors to respond to an RFP with minimal expense. The two to four most qualified firms then emerge from the pool of responders.

The second phase, or final selection, is very different. Pentagon project owners and managers meet with the most qualified firms to review contract specifications and drawings in detail. They solicit and receive suggestions from the firms on how the Pentagon can modify its bid packages. The Pentagon representatives ask the most qualified firms to submit a priced offer with a conceptual design. This phase is costly for the contractors, so the Pentagon offers stipends ranging from $20,000 to $100,000, depending on how much work is involved in responding. Phase Two results in a conceptual design, competition that benefits the owner, best value, and a realistic budget.

The resulting contract has only one major objective: to align the interests of the general contractor with those of the owner. The contract is structured as a fixed-price incentive (firm target) with an award fee. The first source of profit for the contractors is the award fee, which ranges up to approximately 10 percent of the contract price and is based on performance. This is a subjective evaluation by the owner, typically conducted every 90 days. The owner scores the contractor and provides a fee in regular intervals. Firms receive payment within two to four days of their evaluations.

The second source of profit is the traditional guaranteed maximum price (GMP) sharing of under run. The government and the contractor share any savings. The share line is adjusted based on the particulars of individual projects, but it has ranged from 50/50 to 70 percent for the government and 30 percent for the contractor. To be eligible for sharing in the under run, the contractor must perform well on the award fee evaluation. We also split overruns 50/50, up to 120 percent of the contract price.

From the owner's perspective, the principal benefit of the award fee is that it provides an opportunity every 3 months to reward contractor behaviors that are cooperative and helpful. It also provides an opportunity to "send a message" by withholding some award fees when behaviors are counterproductive.

The Pentagon has also dramatically reduced the size of the specification and drawing packages. The traditional specification package for the first phase of the Pentagon renovation (before 1998) included about 3,500 pages. Massive specifications are cumbersome and almost ensure conflict. Contracts have since been reduced to approximately 16 pages of broadly defined performance objectives and thresholds that must be met. The intent is to tell the contractor what is needed, not how to achieve the desired product. Contractors are given broad leeway to design the job in an efficient manner.

EQUITABLE RISK ALLOCATION

The core principle that the Pentagon has reorganized around is that dispute minimization begins well before the contract is awarded. The single most important element of dispute minimization is the equitable distribution of risk.

One of the principle functions of a contract is to allocate risk and doing it well is critically important. In my view, no form of alternative dispute resolution (ADR), partnering, or other good dispute minimization techniques can overcome a fundamentally flawed allocation of risk. There must be an

allocation of risk which reflects the commercial reality of the project, not merely the relative bargaining power of the owner in relation to the general contractor.

There are two principle methods of allocating risk. One is the active method, which is most appropriate for large, complex projects. This is a project-specific plan where the owner develops a detailed understanding of his risk profile. Active risk allocation typically requires substantial planning, time, and cost. There is an up-front cost the owner must be able to bear.

Active risk allocation is suitable for large projects that involve renovation of an existing structure, which is always risky, and projects with unknown factors that are beyond the control of either party. Such factors include geotechnical or environmental conditions, restricted site access, permitting, historic preservation, political issues, hidden conditions, and market/inflation risk in a multiyear contract. Rather than write a contract that puts all of the risk on the contractor, the owner can write a contract with a common baseline. If the actual situation turns out significantly different from the baseline, the contract price can be adjusted (Figure 7.3).

The second useful risk allocation procedure is pre-price general conditions cost. If the project is likely have some delays, as the owner I want the general contractors who are bidding on the project to tell me how much it is going to cost for each day the project is delayed. Then, as exigencies arise, I can have a fairly good estimate of potential delay costs.

With multi-year projects such as the Pentagon, inflation of materials costs is a significant cost driver. The Pentagon hired a cost estimating firm to create a custom inflation index of the materials used on the project. Every three years the base price is adjusted to reflect changing market conditions.

For multi-year projects, it is also in the owner's interest to have a bilateral exercise of options. A bilateral option exercise gives both the owner and the general contractor the ability to "opt out" of future work by giving timely notice to the other party. First, as an owner, I don't want to work with a contractor who doesn't want to be there. Second, bilateral option exercise dramatically reduces risk for a general contractor and, as a result, the initial bids will be somewhat lower.

Establishing limitations on markups in projects employing a large number of specialty contractors is also a useful practice for an owner. I am reluctant to permit markups on work performed by others beyond a certain cap.

Active risk allocation also includes contract type, of which there is a range: from hard money lump sum, to guaranteed maximum price, cost, incentive, time and materials; or a hybrid combination of any of these.

Passive risk allocation is the standard package of clauses found in government contracts or the American Institute of Architects standard form contract. These are allocations of general purpose for items such as differing site conditions, site investigations, unusually severe weather, permits and responsibilities, changes, and the like. Passive risk allocation is appropriate for vertical construction on a previously undeveloped or "green" site, smaller projects with manageable unknowns, standard commercial office spaces, and most federal construction projects.

USING LEVERAGE WISELY

It is not uncommon for owners to attempt to shift the project risk to the contractor up-front because of their leverage at this point in the process. Owners do this by adding clauses that impose no damages for delay, shifting the risk of defects in specifications and drawings to the general contractor. However, commercially unreasonable allocation of risk almost always fails. First, it drives away the top firms, who will choose not to bid on the project. Second, it creates an atmosphere of distrust. Third, it requires contractors to include in their proposals large risk contingencies that may not be realized. Fourth, is the phenomenon called "balloon theory." This is where the owner uses the contract or a regulation, or other leverage to attempt to squeeze costs out of one area. However, these costs will pop up in another area. The courts disapprove of these risk-shifting provisions.

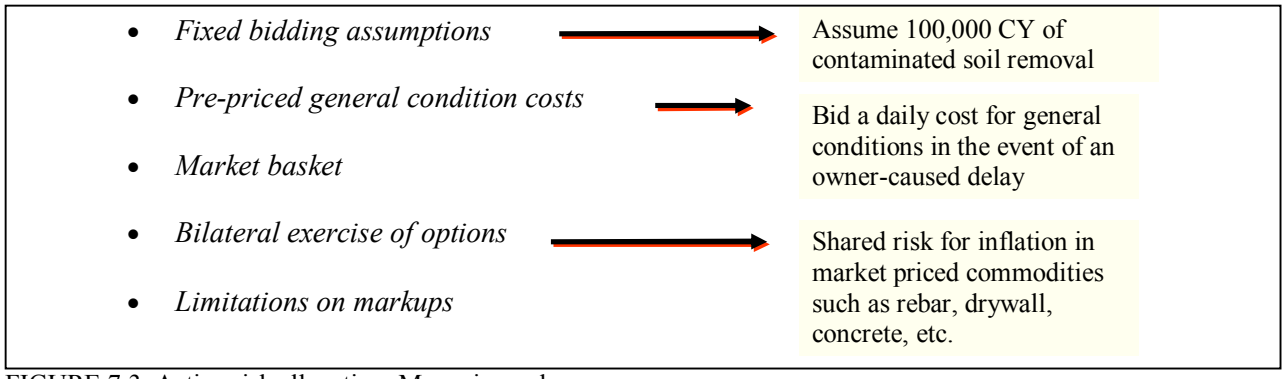


FIGURE 7.3 Active risk allocation: Managing unknowns.

The key is using leverage wisely. Leverage in a construction project, particularly a big construction project, shifts between three principle parties: the owner, the general contractor, and the subcontractors.

In the solicitation and award phase, owners have all the leverage. They can dictate the contract type, the specifications, and the project delivery method, as well as who can bid (based on past performance, bonding or other factors), award criteria (low bid, best value), and allocation of risk through specific contract clauses.

When the owner awards the contract, leverage is shifted to the general contractor. When selecting subcontractors, the general contractor can choose whether or not to honor the subcontractors' pre-award bids, or may "shop" the bids, or adjust significant terms and conditions. In many cases, the subcontractors are relatively powerless at this point and faced with a take-it-or-leave-it contract.

At the mobilization and construction phases of the project, the leverage shifts from the general contractor to the subcontractors, who are responsible for delivering a significant portion of the job. Some subcontractors may feel the need to recover losses through change orders and claims if the general contractor has used them badly. In short, what goes around comes around. If the situation has reached this point, partnering, or other ADR techniques will not work. Effective partnering requires fairness from the beginning.

Another good reason that owners and general contractors should use their leverage gently is the time factor. Phase 1, where the owner has the leverage is very brief, probably 1-3 months. Phase 2, award to the general contractor, may last 1-3 months. For the remainder of the project, which may take several years, the subcontractors have the leverage. No one should be surprised if subcontractors who have been treat unfairly in Phase 2 "return the favor" in Phase 3.

BEST PRACTICES

ADR, partnering, and other hybrid methods of dispute minimization begin with equitable allocation of risk where leverage is used to create an atmosphere of trust. Complex projects require active risk allocation and careful planning. To help create trust and foster communication in the Pentagon renovation project, the owner's representatives, the general contractor, and the subcontractors, all work closely in the same space or trailer. Maximizing communication is critical, but trust cannot be achieved if the allocation of cost and risk is fundamentally flawed.

A number of best practices that emerged during the course of the Pentagon renovation are listed below.

Best Practices for General Contractors

- Manage and coordinate subcontractors proactively.
- Maintain project continuity by (1) involving the project manager in bid preparation and (2) avoiding staff reassignments before substantial completion.
- Avoid frivolous changes by carefully screening subcontractors' proposed changes and their costs; establish a minimum change value; control indirect costs (general conditions, home office overhead, cumulative markups).
- Offer solutions, not just descriptions, when unexpected problems arise on the critical path.
- Hold separate meetings to discuss solutions and "who pays" when resolving issues on the critical path.

Best Practices for Project Owners

- Develop concise specifications and drawings based on national codes.
- Use commercial standards to the extent possible; unique requirements discourage firms from bidding on the project.
- Pay invoices in a timely manner to avoid friction at the job site.
- Provide adequate authority at the job site so that decisions can be made quickly when something unexpected happens.
- Speak with one voice.
- Safeguard the critical path by (1) providing clear and timely direction to the general contractor, (2) providing timely responses to requests for information, and (3) clearly acknowledging changes in the contract scope in writing.
- Hold separate meetings to discuss solutions and "who pays" when resolving issues on the critical path.

Finally, contract clauses that allow contractors to "match existing" or to use a brand name "or equal" product have proven to be one of the leading causes of claims and disputes. If you are the owner and you have no intention of accepting other than the cited product, just say so. And general contractors should resolve any questions they have about matching existing materials when preparing their bids.

RESOURCE

Pentagon Renovation and Construction. Available online at www.renovation.pentagon.mil/sitemap.htm.

8
Methods for Reducing Claims

Summary of a Presentation by Paul Barshop
Chief Operating Officer, Independent Project Analysi, Inc.

One in four projects in the construction industry has a claim. Claims are costly, lead to delays and damaged relationships, but they are avoidable. Strategies and practices can be used to reduce the frequency of claims, because a number of claims appear to be unwarranted.

I make that statement based on a recent study completed by my organization, Independent Project Analysis (IPA), Inc. The study objective was to identify practices that reduce claims by understanding the main drivers of claims so that performance of capital projects improves. The study found a significant difference between the amount submitted for a claim versus the amount actually paid at settlement (Figure 8.1). Even disregarding the skew caused by several projects with very large claims, the difference between the claim and settlement amounts is as much as half.

In a formal survey owners identified the following as primary drivers of claims:

- Increased profit pressures on contractors: 30 percent,
- Poorly developed or executed contracts: 20 percent,
- Increasing risk allocated to contractors: 20 percent,
- Inadequate owner involvement: 10 percent,
- Overly aggressive schedules: 10 percent, and
- All of the above: 10 percent.

The good news is that there are strategies to address each of these issues.

DEFINING "CLAIM"

A claim is a request for compensation not anticipated in the terms of the original contract. A change order that is written, negotiated, and accepted without going outside the project team is not a claim. A *disputed* change order is a claim. Disputes can arise over schedule targets, performance guarantees, or any deviation from the original contract terms that has significant commercial consequences. Claims also include owner requests for compensation for the contractor's failure to meet contractual terms.

IPA obtained data for the claims study using a 100-question survey that covered claims drivers, contractor practices, owner practices and contract clauses, and claim and settlement value. This information was supplemented by a subset of data from IPA's database. Thus we combined claims survey data with existing project data (Figure 8.2).

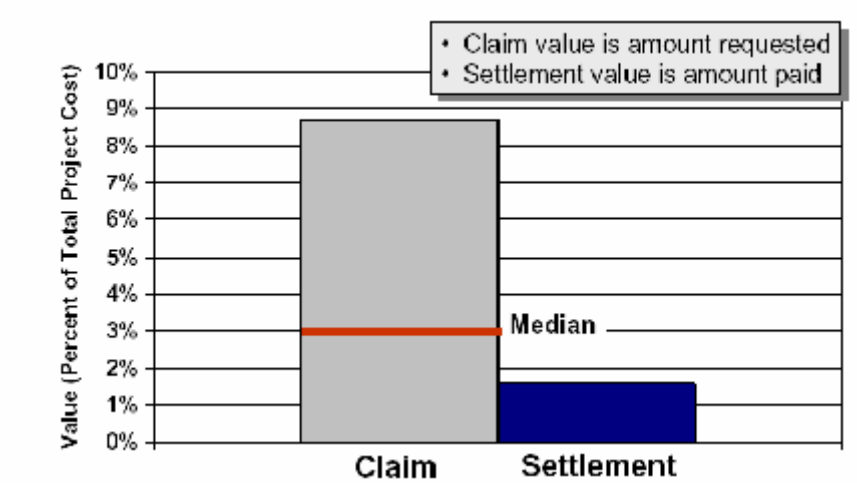


FIGURE 8.1 Claim amount versus settlement value.

GENERAL INFORMATION		- 122 Projects - 21 Companies Represented
INDUSTRY DATA	- Pharmaceuticals - Refining - Steel	- Commodity and Specialty Chemical - Consumer Products - Oil and Gas Processing
LOCATION DATA	- Americas - Europe	- Asia - Africa - Australia
COST DATA		- Range: $4 MM to $1400 MM - Average: $163 MM - Median: $58 MM
AUTHORIZATION YEAR DATA		- All Projects Since 1994 - Average Date of 1997
SCHEDULE DATA		- Execution Median: 20 Months - Cycle Time Median: 30 Months
NEW TECHNOLOGY DATA		- Average less than 3%

FIGURE 8.2 Overview of IPA study database.

IPA's findings are based on 122 projects in more than 21 companies and span diverse industries including energy, chemical, pharmaceuticals, steel, consumer products, and other specialty chemical manufacturers. The average cost of projects in the database is $163 million and ranges from $4 million to approximately $1.4 billion. The database is therefore broad enough to facilitate study of claims and risks.

RISK

Risk is one of the biggest drivers of claims. Projects that transfer more project risk to the contractor are much more likely to have a claim. The drivers of risk are fast-track projects, aggressiveness of contractors' bids, and the contracting strategy.

Fast-track or schedule-driven projects have significantly more claims than conservatively scheduled projects. An aggressive schedule is defined as one that is 70 percent faster than the industry average (we were able to benchmark how long a project should take based on industry experience). We found that 33 percent of aggressively scheduled projects have claims as compared to 7 percent of conservatively scheduled projects. This is not surprising since meeting the schedule depends on equipment delivery and other external factors.

Projects with aggressive costs—projects using costs per square meter or for materials processes that are significantly lower than industry norms—tend to have more claims. This finding is qualified because the result is only significant to about a ten percent confidence level, meaning there is a ten percent chance that the aggressive cost projects and the conservatively scheduled projects have the same frequency of claims.

The data support the finding that competitive contractor bids are more likely to result in a claim (Figure 8.3). There is a clear trend that for projects where the contractor significantly underbids the competition, there is a significantly higher frequency of claims: 70 percent of projects that fit that category will have a claim (Figure 8.4).

These data indicate either that contractors are purposefully being aggressive in their bid and attempting to make up the profits later with a claim, or they did not understand the scope of work and submitted a low bid. In the case of a low bid, contractors will still submit a claim to recoup their costs or restore profitability to a job.

IPA groups contracting strategies or practices into three categories:

- **Lump-sum EPC** is detailed engineering, procurement, and construction performed on a fixed-price basis by the same firm or consortium. This is the design/build strategy.
- **Reimbursable** under which essentially all work is performed on a cost-plus fee or cost-plus incentive fee basis. Reimbursable contracts include those where both the engineering and construction procurements are done on a reimbursable basis. Also included are projects that are incentivized, i.e., where the contractor's profit fluctuates based on project overruns or cost savings.
- **Mixed** is engineering and procurement performed on a reimbursable basis with predominantly fixed-price construction. Design/bid/build is in this category.

When we look at the frequency of claims associated with risk, there is a clear distinction. Lump sum EPC, which transfers the greatest amount of risk to the contractor, has a much higher frequency of claims. In contrast, the mixed strategy has the lowest frequency of claims because the owner transfers risk to the construction contractor at a point when design is 80 or 90 percent complete, drawings are highly detailed, the site conditions are known, and the scope is well-defined. In this case, the construction contractor enters the process understanding the project environment and has every incentive to do a good job.

SHARED RISK CONTRACTS

In theory, there should be fewer claims in shared risk contracts where contractors are rationally assigned the risks they can manage and the owner retains some of the risk. However, the data show no difference between the frequency of claims on shared risk versus predominantly contractor-allocated risk contracts. In our view, this means that the process of risk allocation is not working properly.

When risk is shared, some ambiguity is created about who owns the risk and when they assume the risk; this creates a situation that generates claims. One reason for this is that when owners evaluate project risk, although they nominally want to keep some of the risk, in actuality they tend to push that risk to the contractors. This is not to say that shared risk contracts can't work, only that the methods being used today are not resulting in fewer claims.

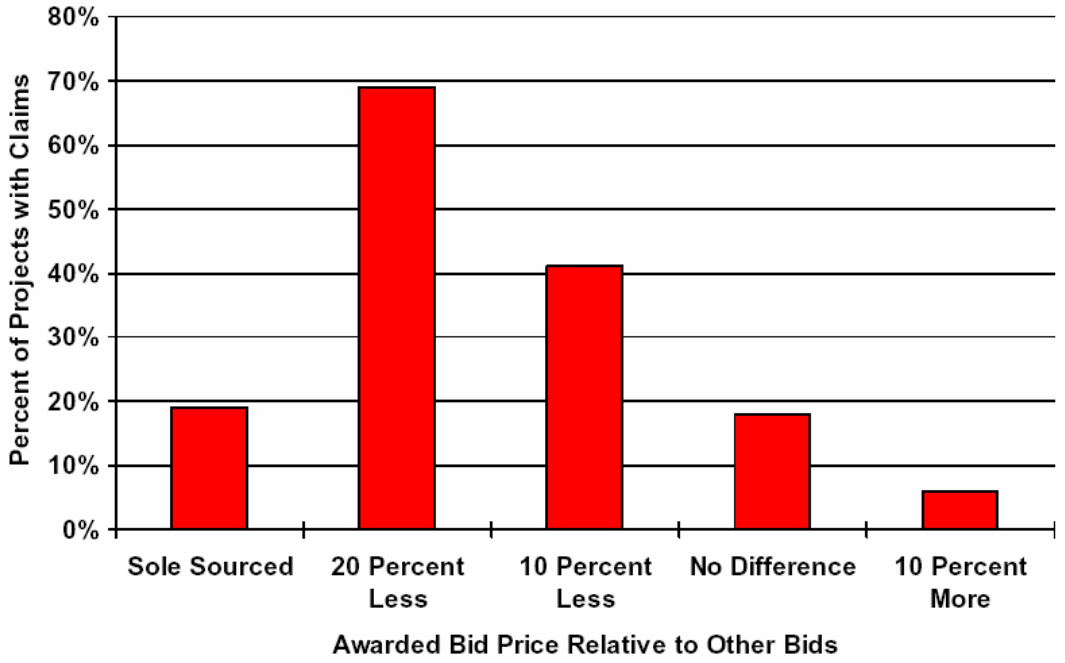


FIGURE 8.3 Competitive contractor bids are more likely to result in a claim. SOURCE: IPA.

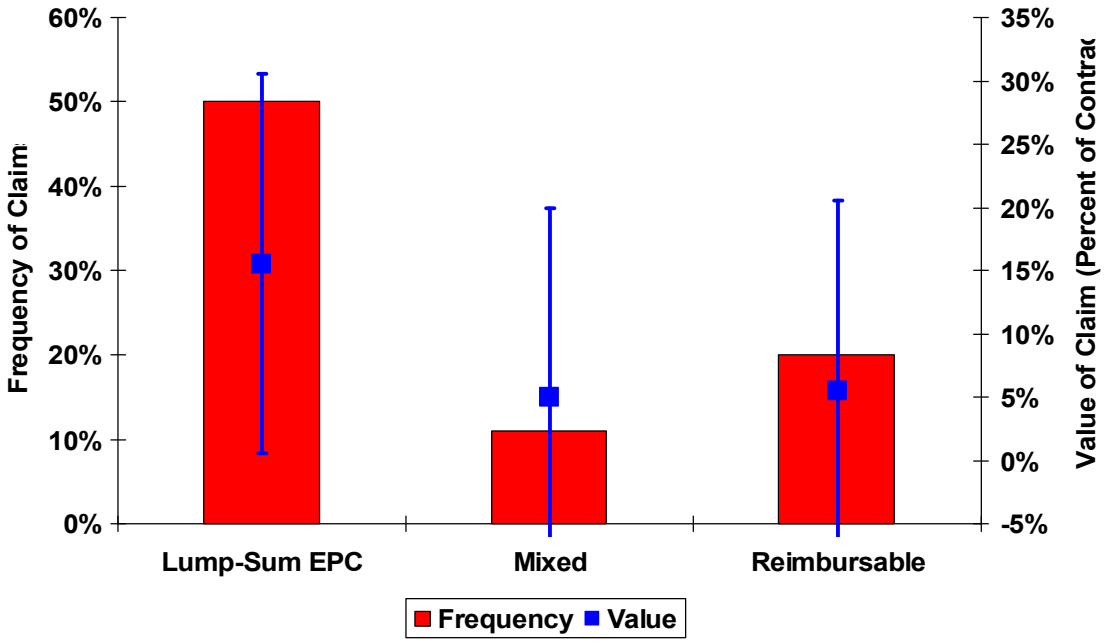


FIGURE 8.4. Frequency of claims associated with three contracting strategies.

Other strategies to reduce claims have mixed results. Contracting alliancing does not reduce claims. Contract alliances are established to incentivize groups of contractors to meet a single project cost target by sharing project profits and losses and managing interfaces effectively. In reality, these alliances deteriorate quickly when the gain-share targets are unachievable and contractors realize they

will not reap the profits they expected. By this point in the process, the owner has lost leverage and is forced to renegotiate the target price or dissolve the alliance and return to a reimbursable arrangement to proceed with the project.

No-reservation-of-rights clauses are not correlated with fewer claims. These clauses state that once a party submits a claim, that party cannot come back at the end of a job to claim hidden costs. Owners have difficulty getting these clauses into some contracts and generally the clauses are not used when the owner accepts risk as part of a project. On the other hand, contractual releases from claims do reduce the likelihood of claims. If there is a waiver of a claim for a specific risk, that does tend to reduce claims on a job.

OWNER PRACTICES THAT REDUCE CLAIMS

There are better alternatives owners can use to reduce claims. Functionally integrated teams—those that include not only engineers but also people with expertise in business, operations, maintenance, construction management, and project controls—give owners the resources they need to better monitor contractors' performance to prevent problems and, when problems do arise, to avoid escalation to disputes and litigation. Only 15 percent of projects using functionally integrated teams had claims compared to 35 percent of the projects using non-integrated teams. Further, all of the projects valued at 1 billion dollars or more that did not use integrated teams had claims.

A good understanding of site conditions also reduces claims by enabling the contractor to mitigate risk or the owner to accept the risk from the contractor.

The frequency of clams is also lowered when there is an expectation of future work (Figure 8.5). Indeed, some claims between owner and contractor were settled with the promise of future work. Looking at projects where the contractor had a very high expectation of future work, the frequency of claims was less than 10 percent. For contractors, the guarantee or likelihood of a steady stream of work is important because the contractors do not have to invest as much time or resources into marketing for their next job.

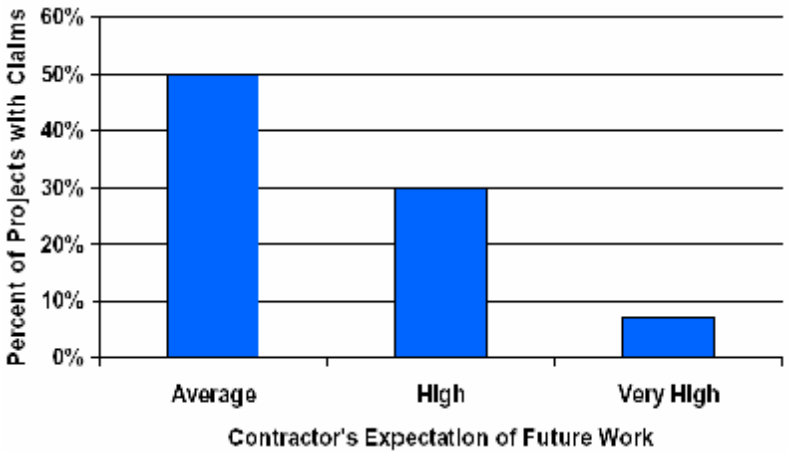


FIGURE 8.5 Expectation of future work reduces the likelihood of claims.

Involvement from the project team in the contracting process also mitigates claims. When corporate lawyers control the contracting process, claims are more frequent. Lawyers are important in the dispute management process, but the project team's involvement is necessary for balance.

There is a correlation between claims and an owner's satisfaction with contractor controls and reporting. That may seem obvious: If the owner is satisfied with the information being provided by the contractor, claims are less frequent. However, if the owner is happy with the contractor's controls but the reporting suddenly slows down or the quality of the information deteriorates, that should serve as a "red flag" to the owner that a problem is brewing and action may be necessary to prevent the problem from escalating into a claim.

EFFECT OF ALTERNATE FORMS OF DISPUTE RESOLUTION ON CLAIMS

IPA has also studied alternate forms of dispute resolution. In terms of reducing claims, arbitration is not effective. Seventy percent of projects with arbitration clauses had claims, and claim-to-settlement value ratios were much higher than normal. The use of arbitration encourages inflated claim values and presents minimal risk for opportunistic claimants. Other forms of dispute resolution such as claims review boards and mediation did not increase the frequency of claims. Of course, resolution costs are less than litigation costs, so these methods appear to be good strategies for reducing claims or at least resolving claims more effectively than arbitration and litigation.

In summary, owners need a multifaceted approach to reduce claims. Such an approach should include strategies and practices to optimize risk allocation, mitigate claims, and address unwarranted claims. To achieve this, owners should

- Prepare for projects with aggressive targets and bids.
- Use contracting strategies, such as design-bid-build, to manage contractor risk.
- Refrain from using the contracting process as a means of shifting risk to the contractor.
- Use functionally integrated teams to oversee contractor work and act when problems arise.
- Understand site conditions.
- Establish limits on value of claims that can be settled at arbitration.
- Use strong owner scheduling and controls resources to ensure an evidentiary trail as a basis for deciding whether a claim is warranted or not.
- Increase the burden of proof by requiring contractual releases and detailed, frequent status reports.

9
Exploring Ways to Encourage and Implement Greater Uses of Dispute Resolution Best Practices

Summary of a Presentation by G. Edward Gibson
Director, Center for Construction Industry Studies, University of Texas

The construction industry needs viable dispute resolution methods because "if your only tool is a hammer, then every problem will look like a nail." In other words, if the construction industry's main dispute resolution tool is a lawyer, every disagreement looks like a lawsuit.

There are many processes, preventative practices, and alternative dispute resolution techniques available to owners, contractors, and other industry participants, but these methods are not widely used. The biggest obstacle has been lack of data. The research program of the Center for Construction Industry Studies (CCIS) at the University of Texas was established to provide some of the required data.

The CCIS was founded in 1996 with a major grant from the Alfred P. Sloan Foundation and with support from other organizations. The center is "dedicated to gaining a comprehensive understanding of the construction industry and to assuring its future competitiveness and advancement in a rapidly changing global environment." One of the CCIS research thrust areas is economic, financial and dispute resolution (EFDR). EFDR research objectives are the following: assessing changes on a variety of issues—claims avoidance, alternative dispute resolution, changing owner/contractor relationships, and risk mitigation for project ventures; determining the effects of changes and processes on the cost and delivery of constructed facilities; and developing responsive policy statements directed at professionals working in the industry.

The Center studies economics, finance, and dispute resolution because there is tremendous interest from the construction professionals who are operating in this rapidly changing environment. Industry issues include project financing methods in the wake of the Enron collapse; the impact of the September 11, 2001, attacks on insurance, surety, and international ventures; and an increase in litigation, either real or perceived. Research on these types of EFDR issues can provide valuable information to industry decision makers.

To date, CCIS has studied owner and contractor relationships, organizational change, the loss of capabilities among owners and contractors, the legal implications of design/build contracting, and risk assessments on international projects.

One study focused on construction claims within the Naval Facilities Engineering Command (NAVFAC) between 1982 and 2002. During that period, 666 claims went before the Armed Services Board of Contract Appeals (Figure 9.1).

The study revealed that claims decreased significantly after 1992, from an average of 38 cases per year to an average of 25, even though the volume of work remained relatively constant-about $2.7 billion dollars of construction work annually, on average, and adjusted for inflation. The drop in claims occurred as NAVFAC implemented partnering processes (in 1991) and the use of design/build contracting (in 1994) (Figure 9.2).

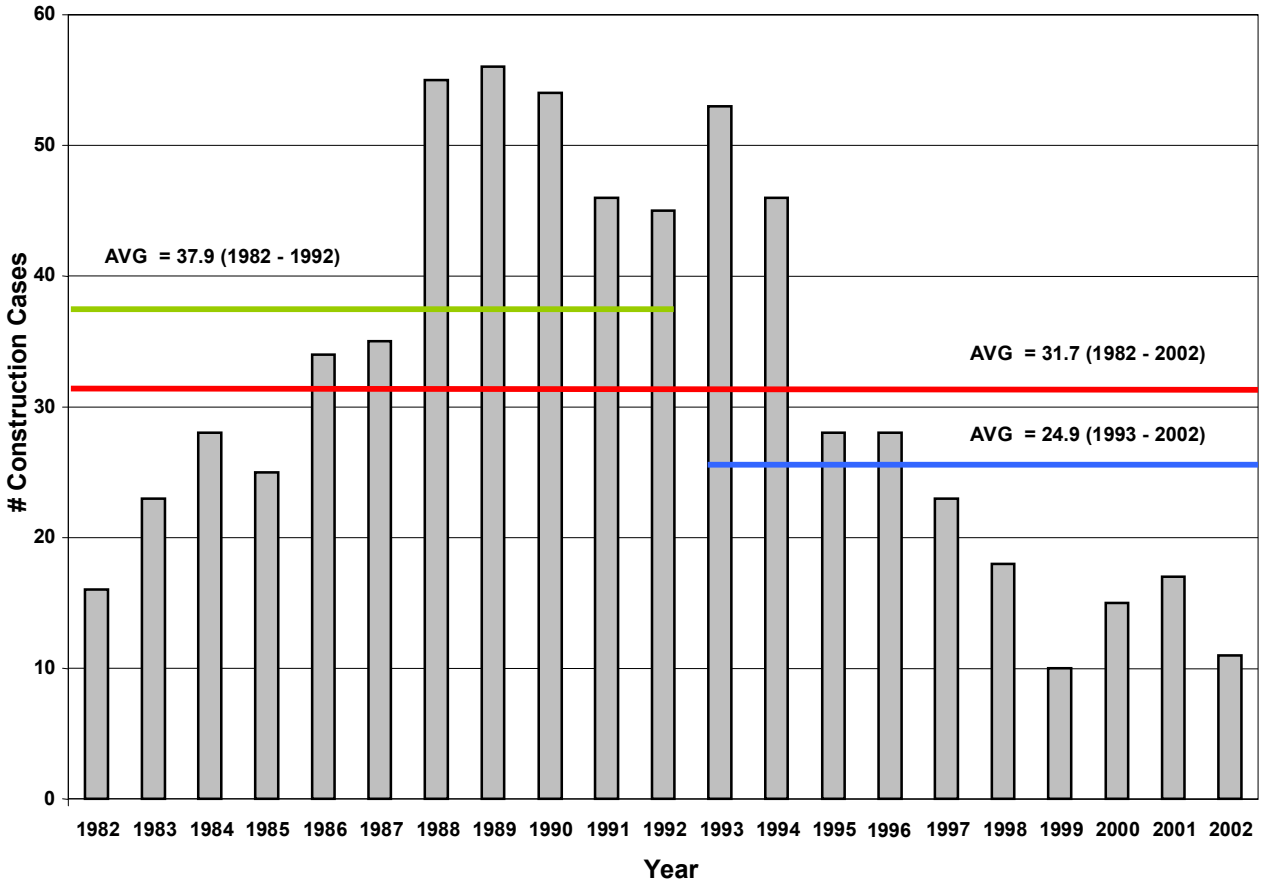


FIGURE 9.1. Construction-related litigation at NAVFAC, 1982-2002. SOURCE: NAVFAC Claims Study.

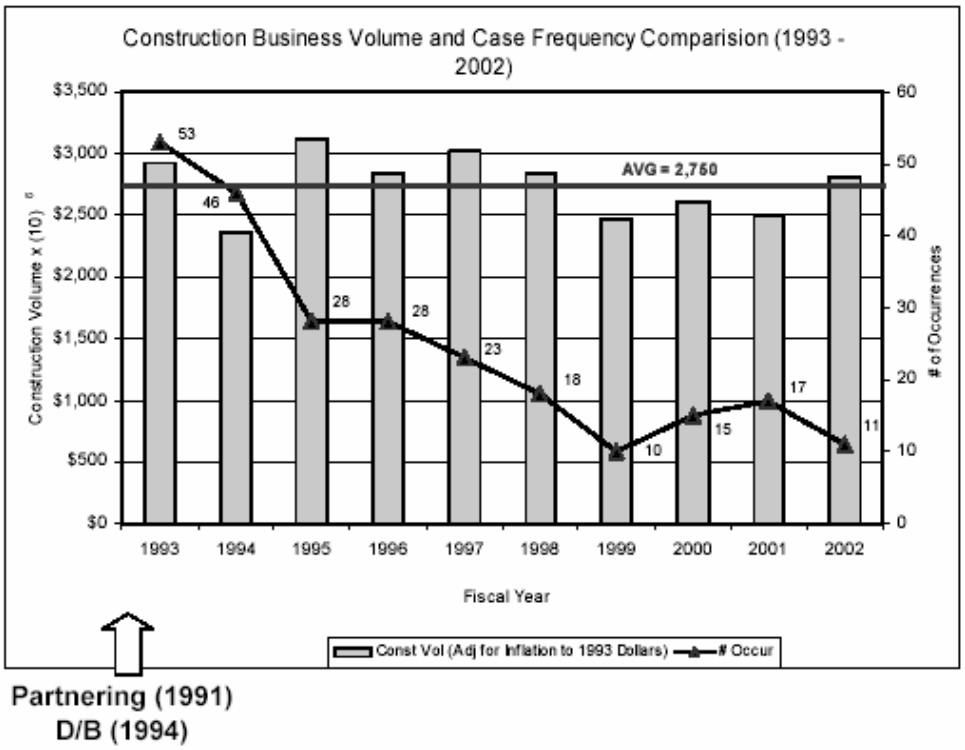


FIGURE 9.2 NAVFAC Claims Study.

Although we can not say that implementing partnering and design-build led directly to a decrease in claims, these were the two major changes that NAVFAC made in the way that they approached work in this time period.

In seeking the reason for the claims, CCIS found that, on the government side, project management procedures and poor communication were often cited. On the contractor side, contract interpretation, project management, and communication were cited as reasons.

A 2003 CCIS workshop in Texas helped identify specific research investigation that would benefit the industry in the areas of economics, finance, and dispute resolution. Three top research priorities emerged:

1. Investigate and document the transactional costs of dispute resolution through the progression of the dispute.
2. Identify up-front programming, planning, and design phase process improvements to reduce and manage disputes.
3. Quantify the benefits of using techniques designed to reduce and eliminate the costs of disputes.

CCIS did some preliminary work on the first priority area, transactional costs. Transactional costs were defined as those costs resulting from disputes, not including money paid out at settlement. Direct costs include fees and expenses paid to lawyers, paralegals, accountants, claims consultants, and other experts. Indirect costs are salaries and the associated overhead of in-house lawyers, company managers, and other employees involved in processing the dispute. Hidden costs are inefficiencies, delays, loss of quality to the project, and the cost of strained business relationships among the various parties.

A preliminary study to validate the methodology was completed. This preliminary study included 25 projects with a total installed cost of $690 million. Thirteen of the projects were public sector and 12 were private sector. These projects had claims totaling $147 million, which were eventually settled for $34 million. The transactional costs involved in reaching settlement totaled $18 million. For individual projects the transactional costs ranged from less than 2 percent to almost 200 percent of the original claim amount. These results cannot be considered final or complete but they are certainly interesting and bear additional research.

Several years ago when I served on the Construction Industry Institute's (CII) Implementation Strategy Committee, we developed a model and mechanism for measuring the implementation of practices. We then studied the implementation of CII best practices among CII members. Forty-one companies responded and the results are captured in Figure 9.3.

Pre-project planning (shown far left) was used by more than 75 percent of the responding companies, while partnering was used by more than half. Dispute resolution, in contrast, was used by only 6 of 41 responding companies.

As part of the same study, we looked at drivers of implementation of best practices. The most significant drivers were support from top management, corporate commitment of resources needed to drive implementation, and a corporate implementation champion.

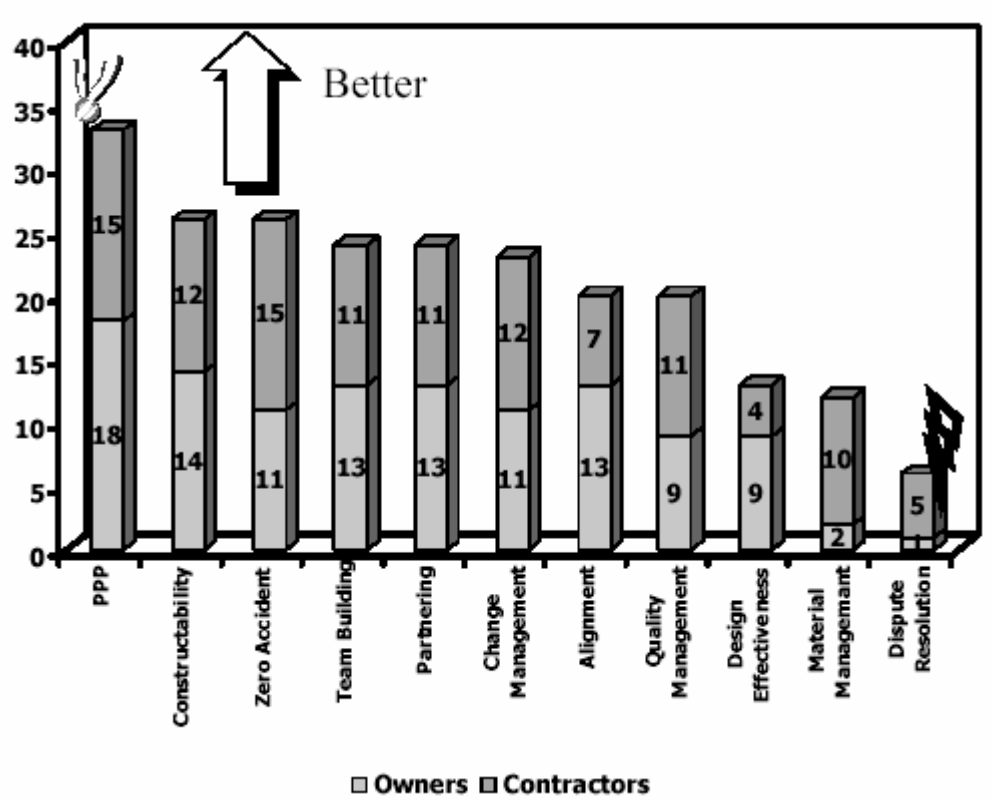


FIGURE 9.3 CII best practices usage among owners and contractors (sorted by popularity).

Other factors that were key for implementing practices successfully included:

Resources

—Provide adequate resources in a timely manner
—Use incentives to drive implementation
—Develop tools to improve implementation

Measurement

—Measure degree and impact of implementation
—Analyze data to take actions

Documentation

—Document self-auditing results
—Document implementation goals and plans

Self-auditing Capability

—Audit organizational implementation on a regular basis
—Track degree of implementation
—Document findings

These results raise an important question: Why are dispute resolution best practices not used more widely? There appear to be a number of reasons, including: lack of knowledge about options; lack of experience in using these tools; comfort with standardized contract language and discomfort with change; resistance to change in the way things are done from project and legal teams; and a belief that "it won't happen to my project."

Despite these obstacles, there is clear evidence that dispute resolution practices work. To adopt effective dispute resolution practices, the construction industry needs to raise awareness among organizations, allocate resources for dispute resolution, educate project teams and legal departments, and develop appropriate contract clauses. Furthermore, organizations need to see measurable results as well as successful case studies to gain confidence in new practices and policies.

RESOURCE

Center for Construction Industry Studies (CCIS). Available online at www.ce.utexas.edu/org/ccis/.

10
Getting Beyond Process to the Roots of Litigation: Changing the Litigious Culture in an Organization and Its Impact on the Construction Industry

Summary of a Presentation by Lester Edelman
Senior Counsel/Senior Advocate, Dawson & Associates
(former Chief Counsel, U.S. Army Corps of Engineers)

Dispute resolution and avoidance programs have proven effective throughout the construction and capital facilities sectors. However, these are merely processes; they are not the solution to our current litigious environment.

Most of the numerous successes of alternative dispute resolution (ADR) occur when the participants truly want to avoid litigation and where the business plans' key strategy is litigation.

Attitudes toward dispute avoidance fluctuate depending on the state of the economy and on organizational or personal cash flow. For partnering, mediation, dispute resolution boards, standing neutrals, and other ADR practices to work on a sustained basis, organizations must go beyond process and confront the root causes of litigation and the existing litigious mindset.

Also, before two or more organizations can succeed in partnering externally, they must first learn to partner internally. They must also understand the negative effects of litigation on their organizations and on themselves.

MOVING TOWARD ALTERNATIVE DISPUTE RESOLUTION

A 1979 U.S. Army Corps of Engineers case in the federal court system that involved defending major water resource projects illustrates the damaging effects of litigation. Although the Corps of Engineers eventually prevailed in court and in a Congressional appropriation procedure, all participants (the government, the railroads, the waterway navigation interests, the environmental organizations, and the nation) paid a steep price for the bitter and costly litigation. The effort was overwhelming, the involvement of key executives was disruptive, and the amount of money spent was enormous and wasteful. Ultimately, the results exacerbated the already poor long-term relationships of all parties in the process.

The Corps of Engineers Construction Contract Program first appeared to be a good antidote to this situation. However, there was a cultural war underway in the construction world where litigation was an entrenched way of life. All parties talked about the so-called "good old days" while blaming each other for their problems. In the meantime, litigation was taking an increasing toll on resources as claims for additional costs were mounting.

At that period, the Corps was quickly approaching a total of one billion dollars in claims. The administrative boards, contract appeals, and the courts required more and more time to decide cases.

Although administrative boards claimed their goal was to speed dispute resolution, they developed practices which, over time, became indistinguishable from those of the court systems. Corps of Engineers Construction Contract Program personnel were spending enormous amounts of time and

effort for attorney preparation and litigation support. The disruption to management was becoming unbearable.

BUILDING ON SUCCESS

Alternative dispute resolution appeared to be the best solution to this problem. Initial efforts using ADR focused on the mini trial, which enabled disputing parties to present their best cases in abbreviated form to a key decision maker in an organization and then use that information to promote subsequent negotiations.

The mini trial enables decision makers with authority and knowledge of broad organizational goals to settle disputes, review the relevant facts of a case, and determine how the case might fare in court. Thus, decision makers are better prepared and willing to negotiate out of court rather than pursue years of expensive and time-consuming litigation.

As the Corps experimented with ADR processes including facilitation, mediation, dispute resolution panels, and non-binding arbitration, the successes multiplied and the construction industry began to take notice. It became evident that if decision makers were prepared to resolve issues, they could apply the same mindset to avoiding disputes before they occurred.

The Corps of Engineers was fortunate that in early use of the mini trial it received a supportive report from the Department of Defense Inspector General, which led to the continued use of ADR in hundreds of cases. In addition, Congress enacted legislation in 1990 encouraging the use of ADR whenever possible.

From its initial efforts, the Corps of Engineers developed project partnering, a prevention and avoidance strategy where parties come together at the beginning of contract performance to agree on processes for avoiding disputes. This new way of conducting business moved the agency from a traditionally adversarial relationship to a more collaborative ethic of trust, cooperation, and teamwork.

The Corps of Engineers realized that if it were to adopt ADR, it had to change the prevailing culture and mindset of litigation. Managers had to understand the concepts of ADR and change their dispute management strategies. Internal criticism posed a problem for negotiated settlement because there were those who felt that their integrity or experience was in question or that funds and resources were being wasted.

However, the Corps' early experiences in ADR enabled great strides in promoting collaborative resolution disputes by establishing a multifaceted program designed to institutionalize ADR as part of the agency's management tool kits. At the same time, the Corps began a program of external communications with people in the private sector. The Clinton administration then supported the program for the entire government.

ADR TRAINING AND DEVELOPMENT PROGRAMS

ADR is most effective when managers are adequately trained to make responsible decisions and resolve disputes efficiently. Therefore, the Corps began organizational transformation with a two-step ADR training program for managers, engineers, acquisition executives, and attorneys. It also supported decision makers and advocated ADR as a management tool for collaborative decision making and enhanced business relationships.

The ADR training program began with the agency's top level managers and decision makers and was followed by regional training programs for senior and mid-level employees. The regional meeting included a comprehensive five-day, collaborative training session and a problem solving course covering ADR philosophy, methods, and applications. The Corps also offered an additional two-day executive ADR seminar for all Corps executives and commanders and four joint workshops with the Association of General Contractors (AGC), which subsequently adopted partnering as one of its key missions.

The Corps supplemented training with a variety of pamphlets describing all the elements of ADR: partnering methods, mini trials, mediation, and facilitation. It also published several ADR case studies to boost confidence in the process. Other awareness tools included research reports, articles, working papers giving practical guidance at every level of the organization, and expert technical support when necessary.

The Corps leveraged its training program to ensure the industry understood strategies, processes, contracts, new technology and terminology, and the value of challenging the litigious culture of construction. The agency realized it could not force acceptance of ADR practices and so was gratified when the construction industry embraced its proposals.

ENABLING CHANGE

Cultural change is possible but requires the right circumstances, supportive leadership, and continued reinforcement. Furthermore, there is no one solution that is appropriate for every organization, so ADR must be tailored to existing circumstances and participants' needs.

Appendixes

APPENDIX A
Forum Agenda

8:45-9:00 **Welcoming Remarks**

William W. Brubaker, NAC, Smithsonian Institution; Vice-Chair, Federal Facilities Council
James G. Slaughter, Jr., NAC, S&B Engineering & Construction; President, National Academy of Construction

9:00-9:30 **Keynote Address: "Changing the Adversarial Culture of the Construction Industry"**

Thomas J. Stipanowich, President and CEO, International Institute for Conflict Prevention and Resolution

9:30-10:30 **Brief Review of Typical "Dispute Prevention and Resolution Best Practices"**

James P. Groton, NAC, Past President, American College of Construction Lawyers
Robert A. Rubin, NAC, Past President, American College of Construction Lawyers

10:30-11:00 **Break**

11:00-12:30 **Specific Examples of Successful Uses of Dispute Prevention and Resolution Best Practices**

Documentation of Successful Results from Using CII Best Practices
Hans Van Winkle, NAC, Director, Construction Industry Institute

Washington Metropolitan Area Transit Authority Successful Uses of Dispute Resolution Best Practices
Takis Salpeas, Assistant General Manager, WMATA Capital Projects

Using "Bridging" and Dispute Resolution to Improve Design/Build Projects
George Heery, President, Brookwood Program Management

Project Success in the Pentagon Renovation Through Dispute Resolution Best Practices
Andrew Blumenfeld, Chief Counsel, Pentagon Renovation Project

12:30-1:30 **Lunch**

1:30-2:45 **Current Extent of Use of Dispute Prevention and Early Resolution Practices Among Project Owners; Why Aren't They More Widely Used?**

Principal Speaker:
Paul Barshop, Chief Operating Officer, Independent Project Analysis, Inc.

Commentators:
Theodore C. Kennedy, NAC, Founder, BE&K, Inc.
James B. Porter, Jr., Vice President, Engineering & Operations, DuPont
Gerald H. Greene, NAC, former Proctor and Gamble Manager

Moderator:
Richard Little, Director, Board on Infrastructure and the Constructed Environment, National Research Council

2:45-3:00 **Break**

3:00-4:00 **Exploring Ways to Encourage and Implement Greater Uses of Dispute Resolution Best Practices**

G. Edward Gibson, NAC, Director, Center for Construction Industry Studies, University of Texas
Lester Edelman, former Chief Counsel, U.S. Army Corps of Engineers
Thomas J. Stipanowich, President, International Institute for Conflict Prevention and Resolution
Michael C. Vorster, NAC, Ph.D., Construction and Management Engineering, Virginia Polytechnic Institute

4:00-4:15 **Summary of Key Points of the Forum and Adjournment**

4:15-5:30 **Reception**

APPENDIX B
Speaker Biographies

Paul Barshop is Chief Operating Officer of IPA, which he joined in 1994. Barshop was IPA's quality manager from 1997 to 1999. From 2000 until mid-2004, he was the director of IPA's Netherlands office that serves clients in Europe, the Middle East, and Africa. As a project analyst, Barshop has focused on evaluating downstream process projects, especially in the petroleum and chemical sectors. He has led numerous benchmarking efforts and conducted over 75 individual analyses of capital projects. He also led research to understand the performance and drivers of control system projects. His latest research effort was the study of the effectiveness of engineering value centers. Barshop has written two articles published in *European Chemical News*. The topic of the first article was portfolio management of manufacturing site projects. The second article discussed project performance differences between U.S. and European chemical companies. Barshop also presented a paper at the 2003 Arabian Gulf Chapter PMI Conference. He holds a Masters Degree in business and a Bachelors Degree in chemical engineering. Prior to joining IPA, Paul worked for Shell Oil in the United States.

Andrew Blumenfeld, Esq., is the principal legal advisor to the Pentagon Renovation Program, a position he has held since 1998. Prior to joining the program, he was with the Army Corps of Engineers where he provided legal counsel to the Kennedy Center for the Performing Arts' Capital Restoration program, the American Battle Monuments Commission, Arlington National Cemetery, and a variety of other large federal construction projects. Blumenfeld has practiced before the Armed Services Board of Contract Appeals, the Corps of Engineers Board of Contract Appeals and the Comptroller General. He holds a B.A. from Hobart College and a J.D. from the Catholic University Law School.

William W. Brubaker is the director of Facilities Engineering and Operations at the Smithsonian Institution in Washington, D.C. and has held this position since March 2001. He leads all of the Smithsonian's facilities planning, design, construction, maintenance, real property management, safety, and protection services activities. Brubaker started his career in 1972 as a civil engineer with the Southern Railroad in Atlanta and in 1976 began work with the U.S. Army Corps of Engineers. From then until 1992, he held various positions with the Corps in Germany, Florida, California, and Oregon. He was a major participant in the Mount St. Helen's volcano recovery effort that earned the American Society of Civil Engineers Outstanding Engineering Achievement of the Year Award in 1991. He was Chief of Army Construction Programming in the Pentagon, managing the programming and budgeting of Army construction worldwide, when selected into the Senior Executive Service (SES) as deputy director of Facilities Engineering at NASA Headquarters in 1992. He was named NASA's Director of Facilities Engineering in 1995 and held that position six years before coming to the Smithsonian. He holds Bachelor and Master of Science degrees in civil engineering from the University of Virginia and Georgia Tech, respectively, a Master of Science in business administration from Boston University, and professional engineer registration in two states. He is a Fellow of the American Society of Civil Engineers, Vice Chairman of the Federal Facilities Council, and former Chairman of the Executive Committee of the Construction Industry Institute. Brubaker was selected Federal Engineer of the Year by the National Society of Professional Engineers and NASA Engineer of the Year, both in 1997. He is also a recipient of the SES Meritorious Presidential Rank Award, NASA Exceptional Service Medal, Army Meritorious Civilian Service Medal, and Army Commander's Medal.

Lester Edelman is senior counsel/senior advocate at Dawson & Associates in Washington, DC. He is an attorney with over 40 years of legal and legislative experience with the US Army Corps of Engineers and the Committee on Transportation and Infrastructure of the United States House of Representatives. He retired in 1998 from his 19-year position as chief counsel of the Corps of Engineers. Prior to the Corps, Edelman served as counsel to the Committee on Transportation and Infrastructure for 11 years. In that role, he focused on preventive law and ways to prevent and resolve disputes. Recognizing that litigation often imposes an unacceptable price on the government and on society,

he focused his energies and those of the Corps of Engineers toward becoming part of the solution to this problem by pioneering the use of alternative dispute resolution (ADR) and partnering (dispute avoidance) techniques instead of costly litigation. Awards include the Presidential Ranking of Distinguished Executive in the Senior Executive Service, presented by President George W.H. Bush. Other awards include the Center for Public Resources "Outstanding Practical Achievement Award for Excellence in Alternative Dispute Resolution," the *Engineering News Record* Award for Exceptional Services to the Construction Industry, the National Performance Review "Hammer Award" for his ADR/Partnering Teams "contribution to building a government that works better and costs less," and many more. Edelman currently serves on the Board of Governors of the American College of Construction Lawyers (the Advisory Committee of the United States Court of Federal Claims) and is a principal to the Council for Excellence in Government. He has been a frequent speaker and published extensively on the subjects of alternative dispute resolution and dispute avoidance, partnering, water resources, water quality, environment, government procurement and "Pride in Public Service."

G. Edward Gibson, Jr., is a professor of civil engineering and the Austin Industries Endowed Faculty Fellow in the Construction Engineering and Project Management program at the University of Texas at Austin. He received his Ph.D. in civil engineering from Auburn University in 1990 and an M.B.A. from the University of Dallas in 1987. He served as associate chairman of the Civil Engineering Department in charge of the architectural engineering program at UT from 2000 to 2003. He currently serves as a member of the Board of Governors for the Architectural Institute within the American Society of Civil Engineering and as a co-director of the Center for Construction Industry Studies at the University of Texas at Austin. Dr. Gibson's research interests include organizational change, pre-project planning, risk management, construction productivity, electronic data management, automation and robotics. In 1996, and again in 2004, he received the Construction Industry Institute's Outstanding Researcher Award for his pioneering work in pre-project planning and risk management. He is an author and co-author of numerous articles and reports on this subject. Among these documents are CII's *Pre-Project Planning Handbook*, *Project Definition Rating Index* (PDRI), *Industrial Projects, Project Definition Rating Index* (PDRI), *Building Project* and the International Project Risk Assessment (IPRA) tool and method. Dr. Gibson has developed several CII education modules for continuing education. He has taught over 200 short courses to industry in areas such as objective setting, team alignment, continuous improvement, pre-project planning, and materials management. In 1996, he received the Lockheed-Martin Teaching Award for outstanding teaching by an assistant professor in the UT College of Engineering. In 1998, he was named the Construction Industry Institute's Instructor of the Year for his efforts in developing and teaching continuing education short courses. In 2002, he was named the Outstanding Engineering Educator by the National Society of Professional Engineers as well as Outstanding Graduate Teacher at the University of Texas at Austin. Dr. Gibson has consulted with many organizations such as Amgen, NASA, TxDOT, 3M, BroadWing, U.S. Department of Health and Human Services, BECK Group, DuPont, Ontario Power Generation, Hensel Phelps, Smithsonian Institution, U.S Department of State, U.S General Services Administration, and Union Carbide among others. He currently serves on a National Research Council committee investigating project management practices at the U.S. Department of Energy. Dr. Gibson has several years of industry experience and is a licensed professional engineer in Texas.

Gerald H. Greene was, until 1998, Manager of Global Capital Management for Procter & Gamble. He is a former President of the Construction Industry Institute, and a 2005 recipient of the Richard Tucker Leadership and Service Award from CII. He is a Charter member of the National Academy of Construction. While with Procter & Gamble he was responsible for managing the company's project management and construction operations around the world, with a yearly workload of approximately $2.5 billion in new manufacturing plant construction and modifications to existing plants. During the course of this work he was responsible for forming a partnership network of engineering and construction firms to take advantage of continuity to insure quality, schedule control, and cost control. After his retirement from Procter & Gamble in 1998 he obtained a law degree from the University of Dayton Law School; he currently volunteers at Legal Aid representing battered indigent women, and he teaches at University of Dayton Law School. Gerald Greene also holds a BS in Civil Engineering from the University of Detroit, and an MS in Structural engineering from Purdue University. He is a member of the Ohio and Cincinnati Bar Associations.

James P. Groton is a retired partner of the Atlanta and Washington, D.C. law firm of Sutherland, Asbill & Brennan and has spent most of his legal career working on construction industry and dispute resolution matters. He established a reputation as an expert in preventing, controlling and achieving prompt resolution of construction project problems and disputes. Since his retirement in 2001, Groton has served as a neutral arbitrator and mediator and been engaged in a number of educational and public services activities in the construction and dispute resolution

fields. He was a founder and chairman of the construction industry's Dispute Avoidance and Resolution Taskforce (DART) and has received numerous construction industry and dispute resolution awards including the Engineering News-Record Medal of Excellence, two CPR Institute for Dispute Resolution awards for practical achievement in dispute resolution, the American Arbitration Association's Whitney North Seymour Sr. Arbitration Medal, and honorary membership in The American Institute of Architects. Groton is a Fellow in the Chartered Institute of Arbitrators and the College of Commercial Arbitrators, a former president of the American College of Construction Lawyers, and a member of the National Academy of Construction. He is a graduate of Princeton University and the University of Virginia Law School.

George T. Heery, FAIA RIBA, is chairman/CEO of Brookwood Program Management and an internationally recognized leader in both the construction program management and architectural professions. In the mid 1960s he was one of a handful of American design and construction professionals who led the development of the new profession of construction management and construction program management. As early as 1961, Heery had already developed advanced project management procedures for controlling time and cost through the pre-design, design, and construction phases of projects. In 1974 he wrote "Time, Cost and Architecture," hailed by McGraw-Hill as "the first definitive work on construction management." Heery developed a real estate and facilities planning concept: Strategic Facilities Planning (SFP)—a component of business planning for business corporations with multiple facilities. He later modified SFP for colleges and universities. Heery then developed "bridging" to organize the roles of architects, engineers and contractors and incorporated a point of specific procedures. The new method was designed to reduce risks, costs and post construction problems for project owners. In recent years the bridging method has been embraced by more and more owners, project managers and architects. A hybrid of the traditional design/bid/build and design/build, bridging retains the best features of both and eliminates aspects that often cause problems for the owner. Bridging greatly reduces owners' risks and costs while allowing full control over design and construction quality and details. From 1994-1996, Heery led Brookwood into real estate development, developing The Wakefield, Atlanta's highest quality and most luxurious high rise apartment building (a cooperative). Projects include the major expansions of the Coca-Cola corporate headquarters, the Woodruff Medical Center Administration Building at Emory University, the 999 Peachtree high rise office building, The Wakefield luxury coop, and many collegiate and professional sports stadiums along with a large number of commercial and industrial projects. Heery has also carried out both design and construction programs in Europe, Mexico, the Middle East, and Japan. Heery is a World War II veteran (U.S. Navy) and received a Bachelor of Science and the five year Bachelor of in Architecture from Georgia Tech and completed the Advanced Management Program at the Harvard Business School.

Ted C. Kennedy is a founder of BE&K, Inc., a worldwide engineering, construction, and contract maintenance firm. He served as national president of Associated Builders and Contractors in 1980 and on the Contractor's Advisory Committee for The Business Roundtable for 14 years. He was also chairman of the Construction Industry Institute in 1988. Under his leadership, BE&K was named one of the top 16 medalist companies out of 300 companies honored in the book, *Companies That Care—The Most Family-Friendly Companies in the United States*. *Fortune Magazine* recognized BE&K as one of the 100 best work places in America, and BE&K's Child Development Center, BEKare, received the NOVA Award in 1991 for innovation in providing benefits to construction workers and recruiting women into the construction workforce. Kennedy received the first Crystal Vision Award from the National Association of Women in Construction for his role in the promotion of women in construction. In 1981 and 1989, *Engineering News-Record* recognized Kennedy as a "Man Who Made His Mark." In 1999, *Engineering News-Record* recognized Kennedy as one of the top 125 industry leaders within the past 125 years. Both Kennedy and BE&K have been honored as inductees into the Alabama Engineering Hall of Fame. Kennedy is a member of the National Academy of Engineering and the National Academy of Construction.

Richard G. Little is director of the Board on Infrastructure and the Constructed Environment of the National Research Council (NRC) where he develops and directs a program of studies in building and infrastructure research and maintains outreach and liaison with federal agencies, the legislative branch, and affiliated organizations. He has directed NRC study activities, participated in workshops and panels, and written papers dealing with many aspects of infrastructure management and technology. Little has over 30 years experience in planning, management, and policy development relating to public facilities including fifteen years with local government. He has been certified by examination by the American Institute of Certified Planners and is a member of the Federal Planning Division of the American Planning Association. Little holds a B.S. in geology and an M.S. in urban-environmental studies, both from Rensselaer Polytechnic Institute.

James B. Porter, Jr., is vice president of Engineering and Operations for DuPont and joined the company in 1966 as a chemical engineer in the engineering service division (ESD) field program at the Engineering Test Center in Newark, Del. He left in 1966 for a two-year tour in the U.S. army. He returned to DuPont as a field engineer at the DuPont Textile Fibers plant in Chattanooga, Tenn. In 1970, Porter was reassigned to the design division as a process engineer at Louviers and returned to ESD in 1971 as a campus recruiter. In 1972, he was reassigned to the Engineering Test Center as supervisor of the chemical engineering testing group. In 1975, he became a member of the ESD field staff. Mr. Porter became field manager at Chambers Works Construction in 1979, followed by an assignment in business methods and investment division as manager of investment engineering in 1981. In 1983, he worked as a design manager for Textile Fibers and then as facilities design manager for Chemicals in 1988. With the restructuring of DuPont Engineering in 1990, Porter became director of Engineering Operations. In 1992 he was named director of operations for the Fluoroproducts business. In 1995, Porter was appointed director of operations. He also assumed the position of vice chairman of the DuPont Corporate Operations Network. Porter was named vice president of Engineering in 1996 and assumed his present position as vice president of Engineering and Operations in January 1999. In 2000, Porter served as chair for the Construction Industry Institute and Delaware's United Negro College Fund. He participates on various industry advisory boards including AIChE's Center for Chemical Process Safety and is a member of the University of Tennessee's College of Engineering Board of Advisors. Porter received a B.S. in chemical engineering from the University of Tennessee in 1965.

Robert A. Rubin is an adjunct professor, Columbia University, faculties of law and civil engineering. Since entering the legal profession in 1964, his practice has been limited to construction matters, particularly the resolution of complex construction disputes. He has authored two texts and numerous chapters and papers and has lectured for the American Bar Association, American Society of Civil Engineers, Practicing Law Institute and other societies and universities on construction contract documents, construction claims, surety law, professional liability, alternative dispute resolution, and government contract law. Rubin is a member of the New York State Bar and is a licensed professional engineer in New York. He is a member of the National Academy of Construction and the Construction Industry Arbitration and Mediation Panels of the American Arbitration Association. He is also a member of the Construction Panel, CPR Panel of Distinguished Neutrals, and CPR Institute for Dispute Resolution. He is a Fellow of the American Society of Civil Engineers; a Fellow and past president of the American College of Construction Lawyers; and a member of The Moles. Rubin is a member of the Advisory Council of the Cornell University, School of Civil and Environmental Engineering; a member of the Construction Group Advisory Board, Construction Contracts Law Report, Thomson/West; president-elect of the Dispute Resolution Board Foundation; a director of the Building Futures Council; and a director of the ACE Mentor Program. He received a Bachelor of Civil Engineering from Cornell University and a Juris Doctor from Columbia University.

Takis Salpeas is assistant general manager for Transit System Development, WMATA in Washington, D.C. and is in charge of engineering and construction of capital projects. Prior to WMATA, he served with BART since 1991 in several capacities: first as project manager for the BART Colma Station Extension, and then as executive manager of West Bay Extensions. Under Salpeas' leadership, the BART rapid rail system cleared numerous political and financial hurdles to begin construction of the 8.7 mile extension to the San Francisco International Airport. Salpeas also worked for the Southeastern Pennsylvania Transit Authority (SEPTA), which serves the Philadelphia metropolitan area. At SEPTA, he was project manger for reconstruction of elevated rail guideways and stations where he directed its engineering development program. Salpeas is a member of the American Society of Civil Engineers; the Transportation Research Board of the National Research Council, the American Public Transit Association (APTA) and the APTA Construction Committee; and the Federal Transit Administration's Construction Roundtable. A graduate of Athens University and the University of Pennsylvania, Salpeas holds two Masters degrees in systems engineering and civil engineering. He is the author of more than 30 professional papers on rail transit topics and has taught civil and transportation engineering at Widener University in Chester, Pennsylvania.

James G. Slaughter, Jr., is president of S & B Engineers and Constructors, Ltd., with home offices in Houston, Texas. The company specializes in engineering and construction services for the refining, chemical, infrastructure, paper and power industries, and prides itself for having perhaps the best safety performance of any major construction company for the last 15+ years. Mr. Slaughter is a native of Houston and received a BSChE from the University of Houston, and attended the University of Toledo and Harvard Business School. He has spent his entire career at S & B, starting as a draftsman in 1967 and filling both engineering and construction positions. Slaughter is President of the National Academy of Construction, an organization founded in 1999 for the purpose of honoring

engineering and construction leaders for their contribution to construction improvements on a national level. He has served as vice president, chair of the membership committee and chair of the initial ad hoc committee that studied dispute avoidance/dispute resolution. He serves on the Construction Industry Institute (CII) Executive Committee. He twice chaired the CII Strategic Planning Committee. He chaired the Front End Planning Team that developed the Project Definition Rating Index (PDRI) and also a tool for assessing project alignment, the Alignment Thermometer. He is a Member of the CII Benchmarking and Metrics Committee, providing leadership on the subcommittee developing National Productivity Metrics for both Design and Construction. He is past President of the Houston Area Contractors' Safety Council.

Thomas J. Stipanowich is president and CEO of the CPR Institute for Dispute Resolution, an international non-profit coalition spearheading innovation and promoting excellence in public and private dispute resolution. Stipanowich has diverse credentials as a mediator, arbitrator (on the CPR and AAA panels), federal court special master, and facilitator. A long-time chaired professor of law, he is an award-winning author of many articles about ADR issues and co-author of a forthcoming text for law schools on dispute resolution. He has also co-authored two of the leading books on commercial arbitration law and practice, including *Federal Arbitration Law: Agreements, Awards and Remedies* (Little, Brown & Co., Aspen 1994). He has advised or participated in important national efforts at statutory reform (the Uniform Arbitration Act and Uniform Mediation Act), served as chief drafter of a protocol for consumer ADR programs, and played an important role in the development of the leading construction and securities ADR rules and policies. Stipanowich has conducted empirical research and analyses on the use of arbitration, mediation and other approaches in different settings and recently produced a major study on the growth and impact of ADR for the *Journal of Empirical Legal Research*. Prior to joining CPR, he founded a non-profit court-connected mediation center that is still in operation. As the first director, he helped establish programs for mediation of circuit and district court matters; worked with peer mediation courses in the public schools; and created and implemented mediator training and accreditation programs and ethical standards. He also facilitated the resolution of various major community issues involving ethnic and workplace conflicts. Stipanowich served as a Public Member and Chair of the Securities Industry Conference on Arbitration (SICA from 1997-2004), as a member of the Board of Directors of the American Arbitration Association, and as Chair of the Advisory Committee to the Global Disputes Research Center. Before going to law school, Stipanowich trained as an architect. He is a Fellow of the American College of Construction Lawyers and a Founding Fellow of the American College of Commercial Arbitrators. He is also one of four Companion of the Chartered Institute of Arbitrators, an Honorary Member of the Marie Garibaldi A.D.R. Inn of Court, and an Honorary Fellow of the American College of Civil Trial Mediators. He is a frequent speaker on dispute resolution topics and has been quoted in *The Wall Street Journal*, *The New York Times*, *The Financial Times*, *The American Lawyer*, *The National Law Journal*, *The American Bar Association Journal*, *Trial*, *Corporate Legal Times*, *The China Daily*, and many other print and online publications.

Hans VanWinkle (Maj. Gen., U.S. Army, retired) is director of the Construction Industry Institute. On September 1, 2003, he became the third director since CII's inception. VanWinkle now leads a collaborative effort by almost 100 organizations from the engineering and construction industries in funding research to improve one of the nation's largest industries. Prior to joining CII, VanWinkle was deputy commanding general of the U.S. Army Corps of Engineers in Washington, D.C. He oversaw the Corps' military construction and real estate services for the Army and Air Force; the Army's national water resources program; and the design, construction management, and real estate services for other defense and federal agencies. During his distinguished and highly decorated military career, he had many key command and staff assignments including as director of Civil Works, U.S. Army Corps of Engineers; deputy chief of staff, Engineer, U.S. Army Europe and Seventh Army, Heidelberg, Germany; director of training, U.S. Army Engineer School at Ft. Leonard Wood, Missouri; commander, Division Engineer Brigade, 4th Infantry Division (mechanized), Ft. Carson, Colorado; and commander, 8th Engineer Battalion, 1st Cavalry Division, Ft. Hood, Texas. Among his military awards are the Distinguished Service Medal, the Legion of Merit, the Bronze Star Medal, and campaign awards from Operation Desert Shield/Desert Storm in Iraq and Operation Joint Endeavor in Bosnia. VanWinkle, a graduate of the U.S. Military Academy at West Point, is a registered professional engineer (Virginia). In addition, he holds a Master of Science degree in public policy from the University of California-Berkeley.

Mike Vorster is the David H. Burrows Professor of construction engineering at Virginia Tech. He served as founding coordinator of the Construction Engineering and Management Program from 1986 to 1993 and as associate dean for research and graduate studies in the College of Engineering from 1993 to 1997. Prior to Virginia Tech, Vorster worked in industry and academia in South and Central Africa. In industry, he was directly involved in the

field construction of heavy civil engineering projects at various levels of responsibility. In academia, he was assistant director of the Graduate School of Business and later chairman of the Department of Civil Engineering at The University of Cape Town. While at Cape Town, Vorster established an executive level construction management program, which provided inspiration and input for similar operations at Stanford, Texas A&M, and Virginia Tech. His teaching and research interests focus on construction equipment, contract administration, and contract dispute resolution. He is a consultant to various companies in these areas and has served on a number of dispute review boards for major projects. He is the academic advisor to the Association of Construction Equipment Managers where he has presented a number of seminars and short courses focusing on the management aspects of construction equipment. He holds a BS in civil engineering, an MBA from the University of Cape Town, and a Ph.D. in engineering from the University of Stellenbosch. Vorster is a member of the National Academy of Construction. He is also a recipient of the South African Institution of Civil Engineers Basil Reid Gold Medal for contributions to construction, the Virginia Tech Alumni Award for Excellence in Teaching, and the State Council of Higher Education for Virginia, Outstanding Faculty Award.