

MORE-STABLE OWNER-CONTRACTOR RELATIONSHIPS

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ABSTRACT: This paper presents an updated and enhanced version of a study conducted by the task force of the Construction Owners Association of Alberta (COAA) on "More-Stable Contractor Relationships." The purpose of the study was to explore the current contracting philosophies, strategies, methods of execution, tendering processes, and techniques. The purpose of the study was also to identify the problem areas and determinants of success in the execution of projects, and to share these findings with the industry for further improvement. We have found that the industry is somewhat complacent and appears reluctant to embrace change. There is a preoccupation with contract award on the basis of lowest lump-sum bid although most recognize that this often results in a higher end price for the product. There is a need for improvement in the areas of life-cycle costing, contracting process, risk management, teamwork, trust, and cooperation, as well as communication and the use of quality management principles. There are ample opportunities to be more progressive. The survey and subsequent evaluation concluded that any initiatives to formulate more stable contractor relationships must come from construction owners.

INTRODUCTION

The Construction Owners Association of Alberta (COAA) organized a workshop on "Construction Best Practices" in May 1994 in Edmonton, Alberta. In preparation for it, task forces were established to look into best practices in the areas of more-stable contractor relationships, constructability review/value engineering, contractor safety performance, work-force development, and labor performance improvement. In the present paper the writers present the findings of the task force on more-stable contractor relationships. The purpose of the study was to identify avenues to create and encourage more stable contractor relationships with the purchasers of construction by identifying and sharing the current practices that are effective, what some of the key problems during execution are, and what should be done to avoid the problems and improve these relationships.

The study was conducted using a questionnaire (Dozzi et al., unpublished survey and questionnaire, 1994) and interviews with key personnel in a broad cross section of owners, contractors, and engineers in Alberta. The task force designed the questionnaire and provided the principal means of gathering information on current contracting philosophies, practices, and techniques used through interviews structured around the questionnaire. The purpose was to promote open discussion and not to lead the responses. Either after receiving completed questionnaires or while completing them, and based on the answers to the questionnaire, individual interviews were conducted with most of respondents to discuss a broader range of issues in more depth. Thirty major organizations in Alberta were contacted by the task force, and 16 responses were received. Although this is a small sample, it represents a wide cross section of leading contractors, owners (public and private), and consultants. A number of international construction, engineering, and contracting firms and owners have their of-

fices in Alberta and hence a high level of expertise in these areas is available. It is expected that the findings of this pilot study are important to the continued development of a healthy construction industry. Similar work is being actively addressed through several centers around the world. This paper first presents a summary of questionnaire replies and interviews, followed by conclusions drawn from the study and finally offers some recommendations.

SUMMARY OF QUESTIONNAIRE REPLIES AND INTERVIEWS

The study sample is small and diverse and does not readily lend itself to statistical analysis. The process used to analyze and evaluate responses was to draw inferences from the information provided and observe some trends and commonalities. Noticeable differences between private and public sector owners, as well as between owners and contractors, were observed. Table 1 shows the variety and mix of the respondents.

Question 1 (a)

"What is your contracting philosophy (or approach) towards the type of construction that you are involved with, either as an owner/purchaser or a contractor? (low price, shared vision, cost effectiveness, innovation, etc.)" (Dozzi et al. 1994).

Price was always a significant issue. Often it was the most important selection criterion. If we segregate responses into "musts" and "wants," the "must" criterion appears to be lowest price, at time of bidding. Occasionally "best price" was identified as the key requirement. This was defined as being the lowest final cost. Prequalification in some form is a requirement, i.e., contracting partners were routinely prequalified based on their past experience in construction of similar projects, safety record, safety enhancement programs, and financial stability. Bonding capacity or capability was considered a form of prequalification. Other identified considerations included the following:

- Establishing and maintaining trust

TABLE 1. Variety and Mix of Respondents

Industry type (1)	Owner (2)	Contractor (3)	Consultant (4)
Heavy construction	B, F, L, N	D, E, G	A, E
Industrial	B, F, N, O, P	D, E, G, J	A, E, I
Other	H, L, M	D, G, J	A, C, K

Note: Respondent companies have been kept anonymous.

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- Handling changes fairly
- Use of a team approach
- Sharing risks and savings
- Technical ability of contractor

Observations Based on Discussions with Respondents

There is a clear recognition in the industry that a focus on obtaining the lowest price fails to exploit constructability, alternative methods and materials, and teamwork. Often constructability is offered as a free service by the contractor. Generally contractors who provide such a service end up with a higher price than others when they bid, because they "know too much." There appears to be a growing awareness among owners of the benefits of using performance specifications that allow more innovation by the contractor.

Interestingly, work in Europe (Turner et al. 1994) shows that project success is more closely geared to functionality and schedule than cost, the latter being a poor third to these other two criteria.

Question 1 (b)

"Why do you believe this philosophy is best for you? (saves money, improves quality, is faster, other)" (Dozzi et al. 1994).

In the public sector, political expediency or correctness appeared as the overriding requirement in the contract selection process. This invariably meant open tendering (no prequalification) and selection of the lowest bid with no qualifications or restrictions included by the bidder. Inclusion of any qualification would automatically disqualify the bidder. This is largely the result of the impact of the Ron Engineering case (Supreme Court Ruling 111) and subsequent court decisions.

In the private sector, a common response was that their approach (regardless of what it was) saves money. Other reasons for adopting a particular philosophy were to achieve objectives of schedule and quality at a competitive price.

It was felt by some owners that breaking down of a project into small contracts permits more involvement of local contractors. The disadvantage of such an approach is reduced opportunities to introduce effective constructability and value engineering processes. Coordination among larger numbers of typical less sophisticated contractors also adds to the burden of administration. Several respondents saw a need to involve local contractors, which are usually smaller in size than the general contractor. This can provide a residual benefit to the operating facility and community in the form of locally available expertise for subsequent maintenance, warranties, and minor construction.

It was also mentioned by many of the respondents that the initial bid price was rarely an accurate reflection of the final cost. This observation is particularly interesting because of the lowest bid practice in North America and other parts of the world. Hartman (1993) in a study involving over 200 industry participants determined that a number of issues impacted on the fixed price of a construction contract. These included the following:

- The allocation of risk often led to inappropriate parties carrying contractual risks with commensurably high associated premiums.
- Consistent with other studies and reports, a substantial portion of construction payments were made as a result of changes or dispute settlements.
- Most construction participants were risk averse.
- The greater the construction volume (in dollars) done per year, the greater the defensiveness, as measured by preference over contract type, use of lawyers, and bidding process.

- There is a direct correlation between defensive contract types and contract administration and frequency of disputes.

In addition, a follow-up study of the perceptions of 62 construction industry practitioners [conducted by Hartman (1993) and consisting of equal representation of contractors, owners, and consultants from heavy civil, resource and process, industrial, commercial, and institutional construction] revealed the following, which related directly to contracting philosophies:

- Using contractor's expertise during the design process increases the opportunity to reduce costs.
 - Contractor input to design does not tend to reduce quality.
 - Many contract disputes are known about (by at least one party) for a long time before they are dealt with.
 - Contractors save claims until the project is complete or almost complete because they do not want to spoil their relationship with the owner. This was also the opinion, though not as strong, for relationships with the consultants.
 - Construction contracts apportion risks unfairly to the contractor and to subcontractors. They do not apportion risks unfairly to the owner or the consultant.
 - Exculpatory clauses increase the likelihood of a contract dispute.
 - Bid prices are affected by the bidder's expectations of fair contract administration.
 - Consultants who act as contract administrators on behalf of their clients are often not completely objective in making decisions about contract issues and interpretations.
 - More efficient risk management will reduce the final cost of construction to the owner.
 - Contractors should be screened and prequalified before being allowed to bid on a contract.
 - A qualified, knowledgeable, and experienced mediator, paid for jointly by both parties to a contract, could facilitate dispute resolution.
 - A fair expectation of profit for a contractor (as a percentage of contract value) is between 0% and 6%.
 1. 22% felt it was below 2% profit.
 2. 69% felt it was between 2% and 4%.
 3. 5% felt it was between 4% and 6%.
- These observations are consistent with the authors experience in the construction industry and also with Schleifer (1990).

Question 2

"What objectives do you consider to be the performance determinants of success for a project" (Dozzi et al. 1994)?

Generally, scope, schedule, budget, and quality (including safety) were identified as the major performance determinants. Other measures of a successful project included the following:

- Facility meets need
- Client satisfaction
- Efficient design and sound execution plan
- Maintaining trust
- Meets operability and maintainability standards
- Innovation and creativity in problem solving, and team approach in respect to the project sponsor and project coordination
- Absence of confrontation in managing differences, minimum changes, and disputes
- Quality of workforce, labor productivity, and work group team approach
- Energy efficient and satisfies safety requirements of users

An interesting and valid comment was that if the project was profitable for the contractor, there was a greater chance that the owner was satisfied. There was some discussion of the level of trust between owners and contractors and of how a key measure of success for this was repeat business. There appears to be some recognition of the need to measure performance during and/or at the end of the projects.

The Construction Industry Institute (CII) (1993) studies also support this and identify an inverse relationship between cost and trust. Hartman (1993) found that project performance is more sensitive to the working relationship between contracting parties than it is to specific wording in contract.

Question 3 (a)

“Which contract types do you use and how successful do you find them? (lump sum, unit price, cost reimbursable, other)” (Dozzi et al. 1994).

Following are the contract types used, in order of declared popularity by respondents:

1. Lump sum: It was the predominant contract type and most commonly used in building and industry. In the current competitive contracting environment, perhaps it gives the best deal. It was also mentioned that the contractor's contribution of his full range of expertise was usually denied by this approach. A lump-sum approach satisfies the public sector's need for a more-open tendering process, in schools and hospitals, for example. However, this approach usually lengthens the schedule because it requires complete drawings and specifications before tendering can commence.
2. Unit price: It was generally considered useful for repetitive or linear work or where quantities could not be clearly determined ahead of time.
3. Design build: It was useful to take advantage of schedule compression, to introduce constructability and try to guarantee maximum price.
4. Cost reimbursable: It was most common on work that involves demolition, renovation, and rebuilding.
5. There appears to be a desire on the part of clients for some form of equity sharing.

These findings were consistent with the study by Hartman (1993), which identified the use of contract types (measured as a percentage of annual construction volume) by 155 respondents split equally into three types as shown in Table 2.

Question 3 (b)

“Does the business environment affect the selection of the contracting approach? (manpower availability, in-house capacity, schedules and deadlines, others)” (Dozzi et al. 1994).

Most of the respondents feel that business environment and the project specifics affect the selection of the contracting approach significantly.

Experience shapes decisions. Decisions also reflect the project type, completeness of drawings, and the amount of in-house expertise available. During poor economic times, unionized contractors feel they cannot compete against non-union ones on price alone.

Observations from Questionnaire and Interview Responses

For new technology, demolition and renovation, owners tend to assume more risk. The business environment affects the aggressiveness of clients in their transfer of risk. Specifically, in a buyers market, owners will push risk onto contractors more aggressively than in a busy construction market.

TABLE 2. Percentage Distribution of Contract Preferences by Respondent Type

Contract type preference by respondent type (1)	Owner (2)	Consultant (3)	Contractor (4)
Lump sum	55.32	50.91	54.72
Unit rate	23.40	20.00	20.75
Cost plus	0.0	1.28	3.77
Other	21.28	20.00	11.33
No preference	0.0	7.27	9.43

It was observed that a tight market leads to a higher incidence of construction liens. It was also observed that it is fairly common for prospective bidders to contribute pretender services in the development of the design and schedules, usually at no direct cost to the owner. This encourages contractors to develop alternatives and to provide advice on design and constructability.

Some clients demand a fixed price. This is especially so among government agencies for whom open-ended arrangements are generally unacceptable.

Question 4

“Do you measure performance and how” (Dozzi et al. 1994)?

There was wide variation reported in performance evaluation methods, i.e., from none to reasonably sophisticated ongoing evaluation throughout the project. The usual measure of success is the bottom line; i.e., most compare actual cost and time to the original budget and schedule. Also, most measurement is the result of a postmortem on the completed project.

On large projects, performance has been measured against critical success factors defined for the project.

It appeared from the study that some contractors would prefer an ongoing evaluation regularly, so that there is an opportunity for improvement.

A good relationship between participants was cited as an important measure of performance. This is consistent with earlier references (question 1) to teamwork, a cooperative approach, less confrontation, fewer liens, and repeat business.

Observations from Questionnaire and Interview Responses

The following observations were made:

- A need was identified by one respondent to develop appropriate performance criteria to measure the effectiveness of the project-management process in terms of continuous improvement, cost effectiveness, and competitiveness.
- An interesting observation was that effective communication was the key to good performance.
- In more recent prequalifications of contractors, safety issues had moved down the list of priorities except for industrial work. More sophisticated contractors and clients conduct safety audits.
- A low or zero incidence of liens and disputes was referred to by some respondents as a measure of success.
- Quality, absence of rework, deficiencies, and above-average productivity were also mentioned as evaluation factors.
- One respondent suggested performance criteria for review during and after construction based on safety/quality, job management, labor productivity, depth of resources, values/ethics, teamwork, continuous improvement, goal setting, team building, and human relations.

These observations indicate diverse perceptions of the main measures of success. There was no exclusion of any criteria; the key to success was perceived differently by the various respondents.

Question 5

“Does your organization utilize any of the following contracting strategies, and why? (build own transfer (BOT); build own operate transfer (BOOT); strategic alliances; engineer procure construct (EPC); engineer procure construction management (EPCM); joint venture (JV); partnering, other)” (Dozzi et al. 1994).

Owners expressed more interest in equity position by contractors in BOT and BOOT projects. BOT, BOOT, and strategic alliances are increasingly important for infrastructure projects with limited public funding available.

There were few opportunities identified for strategic alliances and partnering for the respondents. For clarity, strategic alliances were defined in the present study as long-term associations as opposed to partnering, which was treated as a project-based working relationship. Discussions revealed a cautious embracement of these approaches.

The desire on the part of some owners to lessen the separation of the functions of engineering, procurement, and construction was especially noted in industrial work. This is consistent with other studies and observations indicating a desire to improve constructability.

Some of the respondents also use EPC/EPCM because of their own depth of expertise in using these strategies.

Question 6(a)

“In selecting consultants and contractors what criteria do you use” (Dozzi et al. 1994)?

Most of the owner and consultant (engineer and architect) respondents used some form of prequalification or screening in selecting a contractor. Selection criteria included the following: previous performance, location, financial measures, technical capabilities, safety record or safety program, project team's expertise, working relationship, shared understanding of goals, objectives and interests, quality assurance, execution plan, company culture, management philosophy, labor relations, and specific environment programs.

After prequalification, price was generally the main issue; there have been cases, however, in which a guarantee of schedule has resulted in the award of a contract despite a marginally higher price.

One observation was that when the contractor's bid price was too low relative to the estimates of the owner, the contractor was often still given the contract on the basis of that price, with the owner knowing that it was too low.

Question 6(b)

“What are the advantages and disadvantages of your approach?” (Dozzi et al. 1994).

Identified advantages of the adopted approaches included the following: obtaining a competitive price; good commercial terms (for the owner); meeting goals in terms of cost, schedule, quality, and functionality of the project; establishment of trust between the parties; shared understanding of standards; good communications; and better performance.

Disadvantages for lump-sum tendering included the following: the lowest price may not always be the best overall final price; the contractor's being on a fixed price encourages “shortcuts” in construction; and good ideas for improved performance of the end product or for lower costs may not be heard. For limited-bid lists one cited disadvantage was the pos-

sibility of missing opportunities for business with other contractors.

Question 7

“Are total quality management (TQM) concepts embodied in your contract documents and during the execution of a project? (quality planning, control, assurance, continuous improvement, etc.)” (Dozzi et al. 1994).

The majority of the respondents (two-thirds) were not formally applying any TQM concepts. Some of them were, in fact, not clear about TQM and what it really meant. Some felt that TQM is the application of common sense. The tendency is to make contractors responsible for their product by increasing the use of performance specifications, design/build, BOT, and BOOT contracts. This effectively transfers more and more of the design function to the constructor. The history in industry has been to lay out the specifications and demand that they be met. Responsibility for quality assurance is generally left to the contractor and consultant as part of productivity initiatives in their own interest.

Total quality management concepts are not normally part of a construction contract, although quality assurance programs are increasingly included in the specifications. Contract documents now increasingly include quality assurance standards (such as ISO 9000), specified building procedures, and elaborate inspection requirements. Sometimes quality assurance is an issue in prequalification. Generally, quality assurance programs are instituted internally in the contractor's own interests for competitive advantage, customer satisfaction, productivity, and efficiency.

It was noticed that large companies have established the TQM process in some form as part of their ongoing business practices.

Question 8

“Is the management of risk a deliberate strategy in your contracting” (Dozzi et al. 1994)?

No differentiation was made between pure risk and other types (such as performance, technical, or business), to allow as much room for discussion. McKim (1992) had already established that there is apparently irrational behavior by contractors in addressing risk. The following observations were made:

- Most of the respondents (68%) managed risk by insurance premiums, bonding, and contingency.
- Contractors reported increasingly onerous terms and conditions from public (government) owners.
- Performance specifications were viewed as one vehicle for assigning risk to the contractor. Performance bonds are used to transfer some risk.
- Some respondents recognized a need for a mechanism to allocate risk to appropriate parties.
- One risk-management strategy that was identified was the use of partnering, yet few actually used it.
- In the opinion of some contractors, many contracts are written to protect poor procurement or engineering practices.
- A contract management layer between the owner and contractor, that adds cost and risk insurance premiums, was reported as the usual practice.
- A need was realized by some respondents to move from risk shifting and contingency management to risk mitigation or elimination.
- It was expressed by some contractors that most liability should be borne by the owner or shared. Owners should be accepting risk that is not under the direct control of

TABLE 3. Areas That Need Improvements in Contracting Process

Area (1)	Score (2)
Communications	60
Dispute resolution	60
Claims	56
Contract interpretation	52
Administration	48
Bidding process	43
Paperwork	42
Payment	37
Meetings	37
Insurance	33
Safety	33
Bonding	33

Note: Score = weight \times number of respondents; weight: highest need = 5; high need = 4; medium need = 3; low need = 2; and lowest need = 1.

the contractor. Under strict application of contract clauses, much risk is borne by the contractor.

It was also noticed that contract documents were not filling the intended role of being a guideline for the relationship between the contracting parties through the project. This is consistent with the recent study (Snelgrove 1994), which found that different clauses of a well understood standard contract document were interpreted quite differently by practitioners when measured in terms of how they perceived risk to be allocated to different contracting parties.

It was felt that more effective contracting strategies would enhance a team approach to the resolution of problems. This point was also confirmed in Hartman (1993), which showed that, of 62 respondents, the following agreed on the points identified next.

1. 95% agreed or strongly agreed that the use of contractors' expertise during the design process increased opportunity to reduce cost.
2. 72% agreed or strongly agreed that exculpatory clauses increase the likelihood of a contract dispute.
3. 86% agreed or strongly agreed that bid prices are affected by the bidders' expectation of fair contract administration.
4. 83% agreed or strongly agreed that more effective risk management will reduce the final cost of construction to the owner.

A broader perspective on risk in construction engineering projects can be found in Thompson and Perry (1992). In addition, for the effective allocation of the risks between contracting parties, a process referred to as the "new contracting process" has been developed (Hartman 1994).

Question 9

"Do your bidding and contract documents include clauses for partnering, preaward meeting with the successful bidder with the purpose of contract clause clarification/interpretation, and performance criteria" (Dozzi et al. 1994)?

Partnering

- 73% of the respondents do not use partnering or do not have opportunities to use it.
- Distrust is a hurdle in implementing more progressive approaches such as effective team work, constructability, partnering, and strategic alliances.

- Distrust works against opportunities for partnering. Distrust detracts from the ability to take advantage of the full range of expertise of all the players.
- Trust is required for open communication and sharing of problem solving.

Preaward Meeting

- The majority (90%) of the respondents have preaward meetings between the owner and the contractor.
- Generally these meetings are used for reviewing schedules, clarification of contract clauses and requirements, exclusions, alterations, comparative review of scope of work, and suggested savings.
- Based on this small sample, preaward meetings are rarely used in the public sector and then only if a suspected error is found in the bids.
- Preaward negotiation of terms and price was reported by some contractors.

Performance Criteria

- Schedule, cost, and quality were the main criteria for measuring performance. In addition, most of the respondents also use some of the following: testing procedures, inspection procedures, commissioning methodology, final acceptance, quality control, quality assurance, and safety.
- On more complex projects, critical success factors were discussed and the bidders were invited to expand on how they can improve project-performance criteria.

Question 10

"Do you use any of the following techniques in your project? (incentives, proactive labor relations management, proactive safety enhancement, quality and productivity enhancement, team building, constructability)" (Dozzi et al. 1994).

Incentives

- The meaning of incentives was interpreted differently by respondents, and this included financial incentives, target price, and penalties.
- The majority (60%) of respondents use some form of positive and negative incentives, e.g., liquidated damages clauses with respect to schedules, shared savings with respect to cost, and the opportunity for remaining on bid lists.
- Some of the respondents use internal incentives such as rewards recognizing excellence in safety audits.
- It was also noticed that generally there were no incentives in public sector work.

Proactive Labor Relations Management

About 50% of the respondents use proactive labor relations. Some of the respondents have a labor relations officer to provide open communication. A need was recognized both for better communication and for improved working relationships.

Proactive Safety Enhancement

Three-quarters of the respondents use proactive safety enhancement. Many were safety-statistics oriented, but there were some more enlightened approaches. These approaches recognized that there was a tendency to create "the walking wounded" with a statistics-driven safety policy.

Quality and Productivity Enhancement

Three-quarters of the respondents use quality- and productivity-enhancement.

Team Building

Three-quarters of the respondents reported using some aspects of team building.

Constructability

- Sixty-five percent of the people interviewed use some form of constructability-improvement process.
- Generally, at the pretender stage, constructability was offered as part of market development, to assist in review of drawings, in developing schedules, and to consider alternative construction procedures. In general, not enough advantage was taken of the full range of contractor expertise. Although some contractors were involved in constructability programs, the greater number of contractors were not. Use of constructability was observed more within the private sector than with public work.
- Attention to constructability was high on design/build projects.

Question 11

"What are the areas that need improvement in the contracting process" (Dozzi et al. 1994)?

The replies are presented in Table 3. The areas that needed most improvement in the contracting process as identified by the respondents in order of priority were communications, dispute resolution, claims, contract interpretation, administration, bidding process, paper work, payment, insurance, safety, and bonding.

CONCLUSIONS

The responses to the questionnaire and interview were consistent in a number of important areas. They demonstrated that there is a growing awareness in the industry of the importance of efficient construction processes, methodologies, and strategies. The study found that there was wide acceptance of the view that the preoccupation with awarding contracts on the basis of the lowest lump-sum bid often results in a higher end price for the product. Further, this practice denies the project any benefits of contractor participation in design and in constructability reviews. The insistence on awarding contracts to the lowest lump-sum bid resulted in missed opportunities for effective scheduling and planning. Consideration of alternatives, safety, and productivity considerations were also missed due to the prevalence of lowest-bid awards. Litigation, disputes, and claims were found to be most common in lump sum as compared to other contracts, and this is consistent with other findings (Construction 1993); (Hartman 1993, 1994). The industry could usefully improve the contracting process by moving away from the conventional lump-sum bidding criteria.

The study also confirmed that partnering, team building, cooperative alliances, and alternate dispute resolution are not fully used, particularly in the public sector.

It is apparent that many of the common goals can be achieved by closer cooperation between owners and contractors. Any change initiative, however, must come from the owners as they are the main beneficiary and because they effectively control the contractor-selection process, contract content, and project organization.

Our findings are consistent with those of the Construction Industry Institute (1990, 1993) and other studies carried out in Europe (Turner et al. 1994) and Canada (Hartman 1993) regarding construction industry improvement, use of project-

management principles, cost/trust relationship, and the rapid escalation of disputes until litigation is inevitable.

RECOMMENDATIONS

In the light of the findings of this study, the following is recommended:

- Owners should take the initiative on improvements in contracting methods, project execution, and relationship between the parties. Initiatives must show advantages to all parties if they are to be successful.
- Life-cycle costing of a project should be used by owners and purchasers of construction.
- Improvements should move towards communications, teamwork, trust, and cooperation.
- Application of quality management principles should be encouraged. The "customer" concept needs to be ingrained in the construction process.
- A more systematic and businesslike approach to risk apportionment is needed. Also, we recommend the use of alternative arrangements, such as partnering and pretender processes, which allow the full range of contractors' expertise to be exploited.
- Although there is some legal advice to the contrary we recommend preaward conferences not only to clarify and reach understandings in respect to the contract documents, but also to achieve understandings as to the effective administration of the contract, and to implement constructive, effective processes for the timely resolution of differences.
- Regular, structured, progressive, and constructive processes for the periodic review of construction phase work, as well as postconstruction conferences, are also recommended.
- The industry, including contractors, owners, and labor representatives should invest in the enhancement of communications skills of those who interface on construction sites.

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