Title: Partnering in Public Construction Projects

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Abstract: This paper studies the benefits and drawbacks of partnering in public sector construction projects and makes a recommendation to the city of Portland to move toward partnering in their construction projects. The consensus of interview respondents is that partnering is beneficial and that the city can benefit from such a move. It is recommended that the city's Bureau of Environmental Services begin using partnering on all construction contracts over one million dollars in value. The required steps for the city to implement partnering are also outlined.

Partnering in Public Construction Projects

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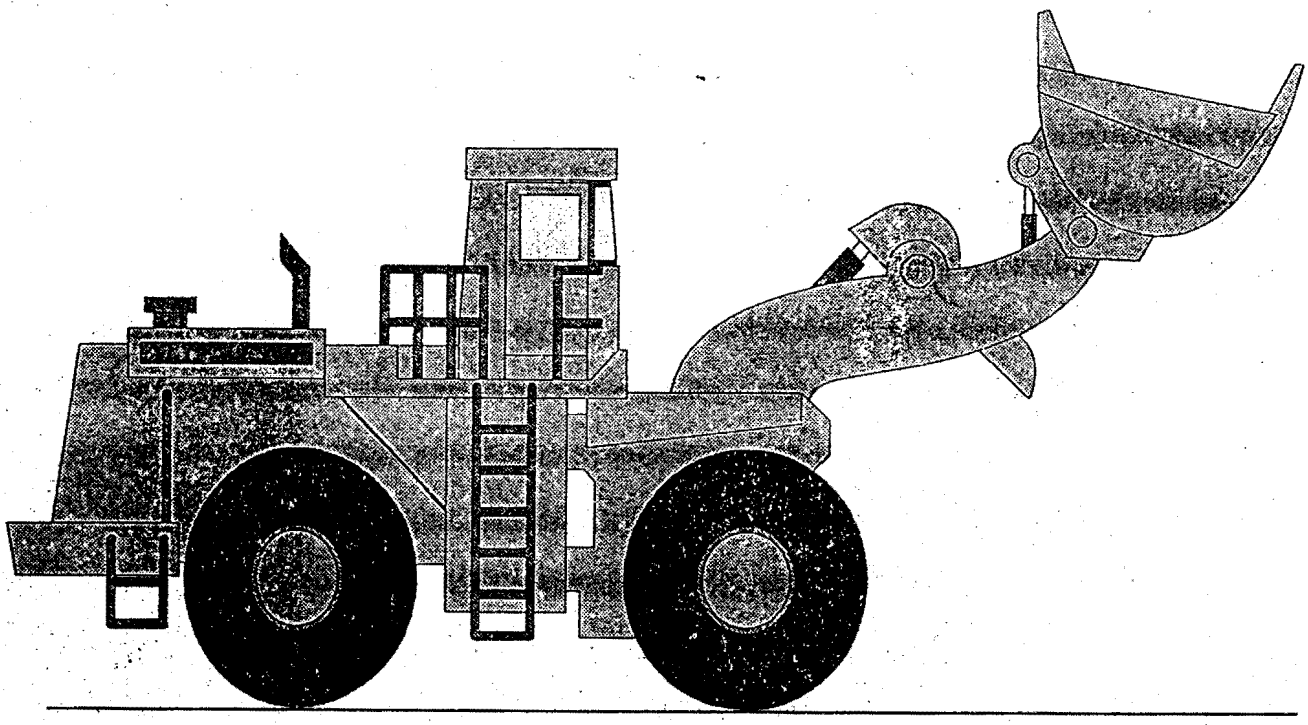
EMGT 560
ENGINEERING MANAGEMENT SYNTHESIS

"Partnering in Public Construction Projects"

Submitted to: Dr. Milosevic

Submitted by: Vu Han & Mark Snyder



PORTLAND STATE UNIVERSITY
Engineering Management Program

August 10, 1993

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EXECUTIVE SUMMARY

This project examines partnering in public sector construction projects. The purpose of the project is to look at the benefits and drawbacks of partnering and make a recommendation to the City of Portland on whether they should implement partnering in their construction projects. Because of its large construction mission and availability of information, we chose to look at the option of partnering for the City's Bureau of Environmental Services (BES).

Because of the unique nature of public sector construction, we focused largely on Portland District, Corps of Engineers partnering experience during the Bonneville Navigation Lock Project. We interviewed twenty-one Corps employees who filled a myriad of roles during this project. Additionally, we received questionnaires from six private sector employees who have been involved in partnered construction contracts. Lastly, we conducted a literature search and looked at partnering from a theoretical standpoint.

As expected, with our diverse group of respondents, we received a wide variety of perceptions and opinions during the interviews. However, there were also many common threads in the answers we received. The general consensus of interview respondents was that partnering is beneficial. In addition to listing the many perceived benefits of partnering, all respondents were also quick to point out many of the drawbacks, especially when dealing with a partner who is not truly committed to partnering for mutual benefit. Respondents also commented on the value of partnering meetings, reasons for varying levels of success in different partnering relationships, and the most beneficial situations in which to partner. The respondents also provided additional comments based on their partnering experience and recommendations on how to improve the partnering process. The information on questionnaires completed by private sector employees involved in partnering mirrored the Corps of Engineers interviews with many similar comments.

Based on our literature search and the results of our interviews and questionnaires, we feel partnering is beneficial and the City's Bureau of Environmental Services should use partnering in their construction contracts. We recommended that the BES begin using partnering on all construction contracts over one million dollars in value. Additionally, we outlined required steps for the City to take to implement partnering.

CITY OF PORTLAND BACKGROUND INFORMATION

The City of Portland provides security, environmental protection, maintenance, and other services to its 470,000 residents who live within the 140 square mile city limit. Its annual budget is about $870 million and it has 4818 employees. The bureaus and offices of the City of Portland are guided by the City Council which consists of a mayor and four commissioners. Each commissioner is in charge of specific bureaus and offices assigned by the mayor according to the commissioner's background, specialties, and interests. (See organization chart in Appendix A-1). Since the City of Portland is too large and too general to study in detail, we have used the Bureau of Environmental Services (BES) to represent the City of Portland for the purposes of this report. BES is one of the largest bureaus in the City of Portland in terms of both budget and resources. Additionally, internal information on the BES is readily available and because of its large construction mission, it is well suited for this study. Throughout this report, the terms City of Portland and Bureau of Environmental Services (BES) are often used interchangeably.

The Bureau of Environmental Services provides industrial waste, solid waste, and sewerage services to the citizens. Its annual budget is about $140 million. Headed by one director, BES has about 400 employees who are organized into five main groups. These are: Business Operations, Environmental Management,

Operations and Maintenance end users) conduct periodic reviews, typically at 30% and 70% complete to ensure that the design is still within the original scope of the project. Any major changes to project scope require the approval of a committee established at the group manager level.

Upon design phase completion, the consultant's final product is a set of plans and specifications. After City Council approval, the project is advertised for bid. The City uses the sealed bid process and after City Council approval of the apparent low bidder, the contract is awarded.

After the City and Contractor have agreed to terms and signed the contract, the project is passed over to a construction manager for construction (See Appendix A-3). The construction manager's job is to force the Contractor to build the project in accordance with the plans and specifications. During construction, the project manager plays a supporting role to the construction manager and is responsible for answering design and other type questions. All communication channels must go through the construction manager.

Upon assignment of a construction manager, the construction manager sets up a pre-construction meeting attended by the City, Consultant, Contractor, and subcontractors. In addition to getting acquainted, key individuals are identified and the construction manager goes over project ground rules to include definition of communication channels, how shop drawings and submittals are handled, how questions in the field are handled,

experienced cost overruns, but these overruns only average about five percent.

Project delays usually occur during the submittal review process and at the end of the project. During construction, the Contractor is required to send shop drawings and equipment submittals to the City for review. The City sometimes reviews the submittals themselves, but often sends them to the consultant. If sent to the consultant, the turn around time is longer. During large projects where there are many submittals that must be formally approved before the Contractor can start work, crucial delays often occur. Additionally, delays often happen at the end of the project as problems are discovered during project testing. Upon completion of construction, operation and maintenance manuals and as-built drawings must be prepared and training conducted; these items are usually responsible for delaying project completion.

Although the City has experienced little litigation, when it has, it has been very costly. On one project the settlement process was extremely agonizing as it took almost eighteen months to reach settlement. This process interfered with the daily work of all parties and wasted time, effort, and money.

CORPS OF ENGINEERS BACKGROUND INFORMATION

The United States Army Corps of Engineers is the nation's oldest engineering organization, tracing its origin to June 16,

southwestern Washington [9]. The district employs almost 1100 people of which about half work at the District's lock and dam projects. Up until the recent implementation of project management, the District was organized solely along functional lines. Project management has helped to integrate the design function (Planning and Engineering Division) with the construction management function (Construction Division) and also tie in the customer (Operations Division) and other support elements. (See organization charts in Appendix B-1 and B-2)

Private construction companies perform all Corps construction. Corps of Engineers Construction Division employees serve as construction managers and are responsible for administering the contracts. The Portland District's only current major construction effort is the tail end of the 330 million dollar Bonneville Navigation Lock Project which opened for river traffic in March 1993.

THEORETICAL DISCUSSION OF PARTNERING

Partnering is not a new concept in America, but it is new for large-scale construction projects. Responding to the increased international competition in the mid 1980's, DuPont Engineering was the first organization to use the partnering process in a large-scale construction project [5]. A project involving DuPont and California-based Fluor Daniel Incorporated started the partnering concept in the construction industry [7].

KEY ELEMENTS OF PARTNERING

As there is no single definition of partnering, there is also no defined set of elements from which partnering is comprised. The components of partnering depend on who is using it and for what application. For public construction projects, we have identified the following key elements of partnering from the Associated General Contractors of America and Norm Anderson, P.E., Chief Construction Engineer for the Washington State Department of Transportation [1],[2]:

Commitment: Commitment for partnering has to come from top management. Each party's top people must be committed in order to steer the people at the lower levels. The partnering charter they jointly developed is not a contract, but rather a symbol of commitment.

Equity: All parties' interests are directed toward creating mutual goals for the project. Additionally, the parties must have the win-win mentality to achieve project success. They must seek win-win solutions to problems rather than solutions that favor one party over the other.

Trust and Openness: Traditionally, many managers have felt it is necessary to distance themselves from a contractor to avoid any appearance of impropriety and to preserve objectivity [8]. This mentality is not part of partnering.

Implementation: No matter how impressive the goals are or how realistic they may appear, if the parties do not take action, they will not achieve their goals. The parties must develop strategies to implement their mutual goals and provide mechanisms to solve problems.

Timely Responsiveness: Timely communication and decision making save time, money, and also keep problems from growing into disputes. At the partnering workshop, the parties establish communication channels and develop problem solving procedures to facilitate rapid issue resolution. Typically, it is best to solve problems at the level they are generated. If they cannot be resolved here, they must be escalated to the next level of management for resolution.

Continuous Evaluation: The parties must develop a plan for periodic joint-evaluation to ensure they are working towards achieving their mutually agreed upon goals. The purpose for the periodic evaluations is to ensure the plan proceeds as intended and the parties are carrying their share of the load. (See Appendix C for Example Joint Evaluation Form)

PARTNERING PROCESS

Traditionally, public works contracts have been written to shift all risk and liability to the contractor [1]. This unfairness creates conflicts for both parties. However, when

in contract price. In some cases, the contractor may initiate partnering. The contractor can propose and initiate a partnering agreement even after contract award since partnering does not change the contract. An essential concept of partnering is "voluntary" and "cost sharing".

Obtain commitment from top management. Because partnering requires additional effort, new behaviors and up-front costs, top management from all parties must be committed to partnering for it to work. The commitment at this level is essential. After contract award, CEO's of the parties must meet to provide visible support and involve other key people at the home office.

Select members of the partnering team. The number of team members vary from project to project, but there should be some guidelines. Most of the partnering effort will be with the on-site managers and their associates. Most of the inter-organization communication, problem solving, and decision making will take place within this group. In addition, there will be a home office support group composed of staff from both parties to include those who were involved in design, scheduling, and purchasing. Care must be exercised to have a balanced team so one side does not feel dominated by the other. If possible, the number of team members should be kept to a minimum to facilitate

The partnering workshop. As soon as possible, all key project players should participate in a workshop. The workshop should be at a neutral site so the parties would not feel that one party has a home court advantage. At the workshop, players get to know each other and develop team attitudes. They examine their experiences and come up with mutual goals for the project. They discuss and develop issue resolution processes to efficiently resolve issues and avoid costly delays. Additionally, they develop a joint evaluation process to measure the effectiveness of the partnering relationship. The evaluation should include both the recognition of positive behavior and deficiencies. Workshop discussions should include definitions of each key player's role and what needs to be accomplished for success in that role. One partnering goal should be a high trust-culture in which everyone feels they can express their ideas and contribute to the solution. Risks and potentially difficult areas of the contract should be discussed openly. At the end of the workshop, all parties sign the charter which they collectively developed and agreed to during the workshop. The charter is a symbol of the parties' commitment to partnering and can also be used as a scale against which to evaluate the parties' implementation of the process. (See Appendix E for Example Partnering Charters)

win) philosophy. It requires true commitment from the parties and not just lip service to the concept. Failure to share information will create problems in partnering. When team players are not open and honest, they are going back to their adversarial environment. Parties should not get into partnering simply to gratify the other party, but should get into partnering because they mean it [12].

Partnering is not a panacea for all cures. It is not a quick fix, a guarantee for profit, or a substitute for good plans and a well written contract [1]. It is not just a project level workshop; it is true commitment from all participants from the CEO's down to the people who actually work at the job site.

CORPS OF ENGINEERS PARTNERING EXPERIENCE

CORPS-WIDE EXPERIENCE

As construction managers and customers, the Corps of Engineers was feeling the effects of the construction industry's trend toward more adversarial owner-contractor relationships and increased litigation. Corps-wide, there was a 200 percent claims growth in the ten years prior to 1989. At the end of Fiscal Year 1990, the Corps had over one billion dollars in outstanding claims. A review of 269 claims (all initiated in the 1980s) to the Engineering Board of Contract Appeals found that the average case took two to four years and several took longer than ten years to resolve. Sixty-nine percent of these were ultimately

District took the initiative and ideas from the Mobile District and Construction Industry Institute and developed a district-wide team approach which resulted in a formalized partnering initiative [10]. The Portland District's initial partnering successes were helpful in convincing the Associated General Contractors of America of the value of partnering. In turn, the AGC was instrumental in convincing the Corps' Chief of Engineers, Lieutenant General Hatch, of the need for partnering. Convinced by the partnering successes, Lieutenant General Hatch directed Corps-wide implementation of partnering in October 1991 for construction projects. Since then, the Corps has partnered over 100 construction contracts without a claim. Moreover, the Corps has continued to chip away at the backlog of claims. Currently, the Portland District has no outstanding or potential claims.

PORTLAND DISTRICT EXPERIENCE

The Portland District has used partnering in the Bonneville Navigation Lock Project. The project, built at Bonneville Dam on the Columbia River, replaced the old navigation lock that was built in 1938. The project began in 1987 and is currently on-going. To date, the District has used partnering in six of the individual contracts.

The District first used partnering in the $34 million "Diaphragm Wall" contract with S. J. Groves and Sons (part way through the contract they became Torno, America). Partnering was instrumental in the resounding success of this contract. The

Resident Engineer spent a week together at the Covey Institute For Leadership in Utah to learn about each other and how to deal with other players more effectively. Additionally, there was a three day off-site partnering session in which forty key players from the Corps and contractor participated. This session focused on developing relationships, team building skills, the joint evaluation system, and development of the partnering charter. Meetings with top management and key players continued to be held about every three months throughout the contract. The joint "Partnership Effectiveness Evaluation" form was jointly completed by the two project managers prior to these meetings and discussed as an agenda item at the meeting to evaluate the status of the relationship and highlight key issues of concern or disagreement.

The partnering sessions in the subsequent smaller contracts were held in a single afternoon meeting in which the participants developed the partnering charter. However, it is important to note that top management was still present at the partnering meetings on these smaller contracts. Additionally, all of these partnered contracts had a close-out meeting to focus on lessons learned to make future partnering relationships more beneficial.

CORPS OF ENGINEER EMPLOYEE PERCEPTIONS

METHODOLOGY

In an attempt to obtain employee perceptions and opinions about partnering, we interviewed twenty-one Corps of Engineers

responsible for negotiating and processing all contract modifications and pay estimates; we also interviewed one of his subordinate modification writers. We talked with the Chief of the Technical Engineering Section who was responsible for receipt of all technical submittals, as-built drawings, operations and maintenance (O&M) manuals, and other technical data. We interviewed the on-site geologist who was responsible for geo-technical oversight and technical advice and we talked to six Quality Assurance Inspectors.

Lastly, we interviewed two Operations Division personnel who are the ultimate customers of the project. We talked with the Manager of Bonneville Lock and Dam and his Chief of Operations whose lock operators began physically operating the lock once it was completed and ready for use.

BACKGROUND INFORMATION

In order to put the interview responses in the proper context, several key items of background information must be discussed. Unlike many Corps construction projects in which the on-site construction office is isolated from the District Headquarters and ultimate customer, this project was built in the customer's "front yard", and designers and other personnel from the District Headquarters in Portland were only forty minutes away. Consequently, the project had much greater visibility and more daily involvement by a variety of players.

All of the respondents we interviewed were involved in the

it did have its successes. A difficult and complex project was completed on time with no fatalities, few lost-time accidents, and no claims or litigation. As one respondent stated, "even in this relationship, partnering enabled us to complete the lock on time."

In summary, when considering the interview responses, it is important to remember that many of the stated opinions are based on experience during the Main Lock Contract and this was the least harmonious of the partnered contracts. Although there were many commonalities in the responses of the broad spectrum of employees we interviewed, there were also many unique perceptions and observations. (See Appendix F for completed interviews)

We conducted fairly spontaneous interviews; respondents did not have the questions ahead of time and did not have a chance to prepare their responses. While this did not really effect the content of their overall responses, it may have prevented us from making some statistical observations about partnering. For example, one of the confirmed benefits of partnering in a reduction in claims and litigation, yet few of the respondents mentioned this. Most respondents may not have thought about this during the course of the interview. If we were to state that only one fifth of the respondents felt that a reduction of claims is a benefit of partnering, we would be incorrect. What we are in essence saying is that one fifth of the respondents mentioned this as a benefit of partnering. More than one fifth may feel this way, but only one fifth mentioned it.

9. If so, why have some partnering relationships been more successful than others?

10. Are there situations when partnering should not be used?

11. Are there situations in which partnering is more beneficial than others (type, size of contract, etc.)?

12. Overall, do you feel partnering is beneficial?

13. How could the partnering process be improved and any other comments?

RESPONDENT BACKGROUND

The first two questions set the frame of reference for the rest of the interview. As discussed in the background information, the number of partnered contracts in which the respondent was involved and his job during these contracts certainly effected the type of responses we received. In order to analyze and understand these perceptions on partnering, we needed to know the employee's partnering experience and frame of reference in looking at the partnered contracts.

PARTNERING MEETINGS

The third and fourth questions addressed attendance at formal partnering meetings and the benefit of these meetings. Eighteen of the twenty-one respondents indicated they had attended at least one formal partnering meeting. Fifteen of these eighteen respondents felt the meetings were beneficial. The three respondents who did not feel the meetings were beneficial came from the on-site Resident Office. Listed below

EFFECT ON DAILY OPERATIONS

Thirteen of the twenty-one respondents indicated that the way they do business on a day to day basis was at least somewhat effected by partnering. Eight of the thirteen Resident Office employees interviewed felt that partnering had no impact on their day to day operations and three more felt it adversely effected the way they conducted business. Not surprisingly, most of the Quality Assurance Inspectors felt partnering did not effect the way they operated. They felt that their job in interpreting plans and specifications was not really effected by partnering. Additionally, an underlying current in those who responded this way was that "they have always treated people fairly and honestly". Consequently, they felt partnering did not change the way they did business.

Two contract modification writers felt that partnering adversely effected their day to day operations. One stated that "there is more emphasis on settling modifications, even if it means paying more than you think is warranted." The other said it is difficult to write up modifications and justify the price when higher level management has already made "deals".

Those who thought partnering positively effected the way they did business on a day to day basis said there was more communication with the contractor early on in the contract, earlier resolution of issues, more open communication, and increased proactivity in resolving problems. From the Resident Office top management came the comments that "I never had to

answers to technical questions, the Corps has been forced to work better and "partner" internally.

One respondent stated that "in theory, there should be a better product with partnering." Improved quality and lower cost growth are often listed in literature as benefits of partnering. However, across the board, respondents did not feel there was an increase in quality or benefit in cost growth as a result of partnering in the Main Lock Contract. As previously discussed, with most respondents focusing on this partnering relationship when being interviewed they did not mention increased quality and improved cost growth as benefits.

PROBLEMS AND DRAWBACKS WITH PARTNERING

All respondents were quick to list some of the drawbacks or problems with partnering. The following are commonly stated problems with partnering:

-People view partnering as a panacea and do not recognize its limitations.

-It is difficult to communicate the purpose of partnering down to the lowest level.

-One party can be taken advantage of. This comment appeared across the board. The following comments express this idea:

-In one relationship we wanted to partner so bad we were afraid to take a hard-line approach and deal with issues that needed to be dealt with.

-There is a perception that in an effort to partner, we are "giving away the farm" or "selling out" to the contractor.

-Partnering is the politically correct thing to do, so we often back off to avoid confrontation.

In summary, there were several drawbacks and problems in some of the Corps' partnering relationships. Again, because most of the respondents tended to focus on problems with the partnering relationship during the Main Lock Contract, some of these comments are specific problems in a less harmonious partnering relationship and not necessarily universal problems with partnering.

VARIED SUCCESS OF PARTNERING RELATIONSHIPS

Of the twenty respondents who indicated they had been involved in more than one partnering relationship, nineteen felt the relationships varied significantly in level of success. As previously stated, one respondent said "that during the first contract, personalities clicked so well that since that time, everyone was set up for false expectations." Overall, the responses were fairly similar. The reasons respondents gave for the partnering relationships varying in level of success included:

-Differences in personalities

-Different corporate cultures and philosophies

-Attitude and commitment of on-site top management

-Magnitude and complexity of the contract (A complex contract will have more players involved and more issues open to interpretation, making partnering more difficult)

-Smaller contractors have long-term relationships they wish to maintain (Both Advanced American Diving Service and Oregon Electric Company have done work for the Corps in the past and will probably continue to do so)

openness changed to protect yourself against risks. A couple of respondents also stated that the time required and level of effort required for partnering may not be cost-effective in smaller contracts.

MOST BENEFICIAL CIRCUMSTANCES FOR PARTNERING

When asked which type of contracts benefit the most from partnering, respondents gave a couple of common responses. As one respondent stated, "partnering is infinitely flexible and can be used in any relationship." Many other respondents reiterated this thought and mentioned that partnering is equally beneficial on any size contract. One key player said "there is value in trying to partner and not be an adversary in any relationship."

Several respondents felt that partnering is most beneficial in the following situations:

-Contracts with tight performance standards or schedule requirements (Partnering provides an avenue to communicate design intent and the rationale for the tight standards or schedule. Additionally, the Corps can benefit from the contractor's expertise and work more effectively as a team.)

-Large contracts with multi-discipline requirements (There are more issues involved and more items open for interpretation)

-Long-term multi-year contracts (More people are involved, there is more exposure to problems, and there is a greater chance for relationships to go sour.)

-When dealing with large contractors (Partnering can help overcome the bureaucracy)

ADDITIONAL COMMENTS AND RECOMMENDATIONS

The last interview question asked respondents for any additional comments on partnering and recommendations on how to improve the partnering process. The following are several unique comments made by respondents:

> -Army Regulation (AR) 600-50 (Standards of Conduct) is an encumbrance on the partnering process in long-term contracts by preventing personal relationships to develop. In a three-year long job, these personal relationships would normally develop if permitted. As an example, a government employee could have his contractor counterpart over for dinner, but could not reciprocate and go over to his counterpart's house for dinner. While designed to keep government employees from being influenced by gifts and favors, it does prevent from developing what would be normally occurring personal relationships. These relationships would enhance trust and benefit the partnering process.
>
> -Partnering is marketed too much and is really a natural process. To people who have always been fair and reasonable in dealing with others, it is almost an insult to tell them that they now need to "partner".
>
> -Partnering brings humanity back into the job.
>
> -Partnering requires trust. Mistakes can be tolerated if they are made in good faith. Trust is easily shattered.

Respondents made the following comments on how the partnering process could be improved:

> -Reach understanding up-front that partnering is for mutual benefit.
>
> -Define terms up-front. Ensure that both sides clearly understand what is meant by quality and other important terms. In the Main Lock Contract, many of the problems resulted from a difference in interpretation of the word "quality". The government's view of "quality" included "doing it right the first time", while the contractor did not necessarily have this philosophy.

-Problems with partnering include the perception that it is a cure-all, the fact that it is difficult to communicate partnering to the lowest levels, the perception that the government is "giving away the farm" by partnering, the escalation of issues simply because one side does not "like" the answer they get, and the potential for getting taken advantage of when dealing with a partner who is not committed to partner for mutual benefit.

-Differences in personalities, corporate cultures, and on-site top management effect the success of the relationship. Partnering requires commitment, trust, and honesty on both sides for the relationship to be successful.

-Partnering is beneficial in any type of contract and should always be attempted. However, if one partner is not really "playing fair", the other must reassess their openness and protect themselves from being taken advantage of.

-A common definition of terms (such as quality) needs to be agreed upon up-front.

PRIVATE SECTOR EMPLOYEE PERCEPTIONS

In an attempt to obtain perceptions and opinions about partnering from personnel working in the private sector, we used the same interview questions we asked Corps employees and received information from six individuals. Of the six respondents, we interviewed one and received written responses to our questions from the other five. (See Appendix G for completed interview and questionnaires) The six respondents listed their roles as follows:

-Mechanical subcontractor (Corps construction project)

-Manager (contractor)

-Civil Engineer subcontractor to an architect

-Project Manager for consultant providing engineer services

-Mutual trust of each other's motives

-Better and faster communication with more emphasis on timely solutions

-A team attitude with less adversarial relationships; this also resulted in more enjoyment

-Increased quality, productivity, and profits with less cost

Two of the respondents felt there were not drawbacks or problems with partnering. The others listed the following problems in partnering:

-It's difficult if one party has not really "bought into it"

-It can be expensive (However, the cost could be offset by savings it may generate in other areas)

-Resistance to change in attitudes

-It is difficult to get new people up to speed

Since only three of the respondents had been involved in more than one partnering relationship, we received little information about the different levels of success in partnering relationships. One of these felt there were no differences in level of success, one did not know, and one stated that the difference in success was due to top management commitment.

Two of the respondents stated that partnering may not be beneficial in short-term, straightforward contracts or small contracts in which the cost of partnering may be prohibitive. The others did not list circumstances when partnering should not be used.

with mutual benefit for both parties. Partnering strives to improve relationships by promoting trust and open and honest communication. If this is achieved, the goals of more value engineering savings, elimination of claims and litigation, timely resolution of problems, and reduction in case-building paperwork will follow. As indicated by Corps of Engineer employee interview responses, the Portland District has benefitted from partnering in all of these areas. Even in a partnering relationship which many respondents felt was "bad" or "one-sided", there were benefits.

The Corps' least harmonious relationship is beneficial in pointing out several of the potential drawbacks of partnering. These problems include selling partnering to the lowest levels, convincing these employees that the government is not "giving away the farm", and avoiding being taken advantage of by a partner who is not "playing fair" and not partnering for mutual benefit.

As one respondent stated, "partnering is infinitely flexible and can be used in any relationship." However, participants must realize that due to different personalities and corporate cultures, every relationship is different.

One respondent stated that partnering would best be used in "design-build" contracts. Logically, there could be more benefit in this type of contract since the improved communication from partnering could help the contractor better understand the customer's needs and desires while formulating the design.

personnel, it may not be cost effective to initially partner small contracts. Once the City has gained experience and lessons learned from partnering on larger contracts and has qualified in-house personnel who could serve as partnering workshop facilitators to reduce partnering costs, they may want to extend partnering to smaller contracts. If there are great benefits on the million dollar contracts, it is logical to lower the dollar threshold for partnering. If however, partnering is only marginally successful on million dollar contracts, the City may elect not to extend partnering to smaller contracts. We recommend the City initially partner all contracts in excess of one million dollars and adjust the dollar threshold for partnering based on their experience. We suggest use of the following process to begin partnering (this is similar to the process referenced earlier in our theoretical discussion):

-Obtain training for key personnel on the basics of partnering. There are many consulting firms who offer this service. Train down to the lowest level employees.

-Obtain information from the Corps of Engineers and other public agencies on their partnering experience to include "lessons learned".

-Put an invitation to partner in each contract bid document.

-Initially use experienced consultants to facilitate partnering sessions until everyone becomes comfortable with the partnering process.

-Involve both design and construction personnel and consultants to facilitate improving internal relationships and coordination.

-Monitor key relationships and be wary of the potential pitfalls and previously experienced problems in partnering.

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APPENDICES