

International Bar Association Conference 2002

Durban, South Africa

20 – 25 October 2002

SECTION ON BUSINESS LAW

Committee: T

Session Title Project Alliances: (Why) Do They Work
Thursday 24th October 2002, 1400 to 1700

Author **Andrew Baird CEng, PrEng, BSc(Hons), FICE, MSAICE, MAPM.
Engineering Contract Strategies, Johannesburg, South Africa**

Title of paper:

Collaborative styles of working using the NEC system of standard form contracts

Paper Abstract:

This paper describes a highly successful project completed using a collaborative style of contract – the NEC Engineering and Construction Contract (ECC) – with a traditional contracting strategy, and no formal partnering charter. The methodology towards a more structured approach to partnering is then described using the NEC system of contracts. The paper concludes with a case study of a project set up from the outset to use a mature approach to partnering.

Keywords:

Project Alliances

Collaborative Contracts

Partnering in practice

Contracts between Partners

NEC and Partnering

COLLABORATIVE STYLES OF WORKING USING THE NEC SYSTEM OF CONTRACTS

1 An example of note

- A US\$65M new City centre Bank headquarters of 85,500 m² completed in 39 months.
- Main JV contractor and 56 trade subcontracts.
- Traditional Bill of Quantities re-measurement contract.
- No formal partnering charter.
- Just under 1000 variations.
- Completed 4% under original budget.
- No extension of time.
- All parties paid and signed off within 10 days of substantial completion.

2 The ABSA Bank Towers North project in Johannesburg

- NEC helped a large, innovative building project undertaken in a very difficult economic and political environment achieve its time and cost targets.
- The interests of all the internal and external stakeholders were explicitly taken into account in all major decisions.
- The project was led by experienced project managers who used NEC because it supports best practice project management.
- NEC programme provisions provided a robust basis for managing the project.
- The best firms, rather than the lowest bidder, were carefully selected for each contract and each subcontract.
- Workshops and training in NEC were provided for all the many firms involved in the project.
- Teamworking quickly became a key feature of the project team's approach.
- Value engineering was used to optimise the design within carefully defined cost constraints.
- A period was allowed between appointing the contractor and start on site to review and improve the constructability of the design.
- The almost continuous design development, which is characteristic of large individually designed building projects resulted in many changes which required the early warning and compensation event procedures to be streamlined.
- The quality control systems developed and improved in response to lessons identified at three monthly reviews.

This project, planned and completed in 39 months, provides a US\$65 million new bank headquarters which it is hoped will encourage the revitalisation of Johannesburg's central business district. The new building covers two city blocks, has a total floor area of 85,460 square meters, arranged in three basement levels of car parking, two ground floor levels and six upper floors built around a central atrium. It provides modern accommodation for over 2000 ABSA Bank staff who were previously spread among five other buildings.

NEC was used on this important building project which involved a considerable amount of change and design development in a difficult environment, and yet was finished on time and within budget. This achievement is unique in the recent experience of the South African building industry. The project

demonstrates how the NEC approach, faced with the high number of compensation events typical of large, high prestige building projects, encourages the project team to work cooperatively and adopt many of the features found in well developed partnering.

The client set stringent requirements for the project and established a system of measurements to determine how effectively they were being met. A firm of professional project managers, Barrow Projects (Pty) Ltd, was recruited to take primary responsibility for delivering the project. The client, ABSA Bank, has no hesitation in confirming on the basis of objective measurement that project management exceeded their expectations.

Barrow Projects recommended that NEC be used because it supported their own well established project management system and encouraged cooperation. At the time, there was little experience of NEC in the South African building industry, so the project manager warned that a major culture shift from traditional practice would be involved. ABSA accepted the project manager's recommendation, and NEC training was provided for all the firms involved.

The design was produced by the client's professional team on the basis of NEC Professional Services Contracts. The client and project manager decided to appoint four *Supervisor's* under the main ECC construction contract instead of the usual one, one supervisor from each of the four main design consultants. Each supervisor was responsible for the design continuity and quality of that part of the works designed by his firm, for which they carry professional design liability. This arrangement worked well and did not give rise to confusion over responsibilities or gaps in the quality control system, initially thought to be a concern.

Two workshops were held for the joint client (the employer) and professional project team at a very early stage. All the firms involved were represented at the workshop by their highest level of management, ensuring that they understood and would support the use of NEC. Under the positive leadership of the client all members of the professional team, sceptical at first, placed themselves and their firms fully behind the intent of the NEC system from the outset. Whilst the industry focussed on the 'new' management system for this project, there were also numerous technical advances made in the field of building energy management systems under the leadership of architect, TC Design Group. With the workshops creating a new culture of team working and innovation from the outset there were innovative value added spin offs into many other aspects of the project and operations of its participating firms, which would probably have never been considered under previous ways of working.

Contractors who prequalified for invitation to tender were first provided with the employer's business case for the project and then required to attend, again at their highest level of management, an ECC training course. This took place just before tender documents were issued and was also attended by members of the professional team to provide continuity and start the team building process.

Construction work was provided through nine contracts, by far the largest being for the building. The other prime contracts were for furniture, fixtures, operating equipment and artworks. The tender documents for the building resulted from a disciplined design process led by the project manager. Value engineering was used to optimise the design within cost constraints. The resulting design, cost plan and programme became the project manager's baseline document in controlling subsequent changes. As a result, the tender documents included drawings and specifications providing a virtually complete description of the building with the matching bill of quantities.

The main building contract provided a construction period of 27 months. It used ECC Option B, Priced contract with bill of quantities, with the important provision that the work was to be completely remeasured to determine payments and the final account. This is an aspect of normal South African practice that is not part of the ECC approach and generally should not be necessary.

The successful contractor, a joint venture between Murray & Roberts and LTA, was given a month before moving on to site to go through the design with the professional team. The contractor provided

many suggestions for making the design easier to construct and final design details were prepared on the revised basis. One major example is that the original design used normal brickwork, but the contractor proposed replacing this with brick faced concrete cladding panels. This was accepted by the professional team which defined the design criteria and worked with the contractor on the redesign, which produced the same costs, ensuring more reliable quality, greater certainty of meeting the programme and a better looking building.

NEC procedures for maintaining up-to-date accepted programmes for all the required work in both ECC and PSC contracts gave the project manager a robust basis for integrating all the work. For example, he used them to maintain up-to-date schedules which ensured that designers knew exactly what they had to produce to meet the needs of the construction process.

There were 56 subcontractors, appointed in essentially the same way as the main contractor. This included training courses for all the firms invited to tender. These were attended by representatives of the main contractor and professional team to provide continuity and build on the culture change already underway. The training took place before the invitations to tender were sent out and had a clear and positive effect on the quality of the tender information provided by the subcontractors.

The project team put a lot of effort into selecting the best subcontract tender, which was often not the lowest. This was done on the basis of tender reports produced jointly by the project manager, architect, quantity surveyor and main contractor. These were reviewed at meetings which also included the subcontractors, as necessary. When a subcontract tender was accepted, there existed a good understanding of what had been agreed and the idea of cooperative working was already in place. This gave several benefits, including faster starts on site, fewer queries and fewer problems. Subcontractors were generally prepared to accept small changes without turning them into compensation events. The fact that the bill of quantities was being remeasured dealt with many of these, but there was also evidence of a willingness to join in the team effort to produce a good project on time and within budget. Substantial changes could be accommodated, agreed early and paid for as the work was underway, so the subcontractors' cash flow was improved and final accounts were settled faster than with traditional approaches.

The project manager held weekly meetings with the main contractor and with the professional team to deal with all outstanding early warning and compensation events. These meetings included the employer's representative who was responsible for ensuring that decisions required from the client were made in due time. Similarly, the contractor held weekly meetings with subcontractors affected by compensation events currently under discussion. This regular pattern of meetings has ensured that, although there were close to 1000 compensation events, they were agreed approximately within the times allowed in the contract. This is widely seen as having provided an unusual degree of certainty over the outcome of the project, and was achieved without recourse or threat of recourse to the adjudicator.

The compensation events generated a mass of paper work for the contractor, but he gradually recognised that to a large extent this was under his control. In most cases it is the contractor who decides that something should be treated as a compensation event. He realised fairly quickly that it is sensible to absorb small value items because the paper work costs more than the likely extra income. This realisation is all part of the contractor developing a more professional approach which accepts that he is the expert in construction matters and should be able to stick to a budget. Partnering engenders this same approach in the whole project team, concentrating their efforts on meeting the employer's requirements rather than creating paperwork.

The procedures had to deal with some substantial changes to the employer's requirements resulting from the late acquisition of land and the need for a new Dealers' Room incorporating state-of-the-art technology. The risks involved in making these changes were carefully evaluated under the direction of the project manager. NEC procedures allowed him to seek alternative quotations from the

contractor for different ways of dealing with a compensation event, which helped ensure that completion was not delayed.

With the well disciplined controls afforded by the compensation event procedure firmly in place, the employer was aware of the likely final cost of his project at all stages. As compensation events for additional cost were processed, the employer in co-operation with the professional team and main contractor sought other compensation events that provided savings. In this way the client's original budget was never changed, and final cost was 4% less than budget. Apart from the initial extension of time caused by late access to the site, the main contractor's completion date was never adjusted in spite of the nearly 1000 compensation events. The contractor's quotations for compensation events were always based on maintaining the original completion date.

Quality management began by carefully defining the employer's brief. This provided the key document in quality plans which were drawn up for every firm involved in the project and included in contracts. Performance against these quality plans was formally reviewed every three months to identify problems and look for ways of solving them. On occasions this led to the employer and project manager agreeing that they needed to behave differently because they were inhibiting the quality delivered. In other cases consultants, contractors or specialists needed to work differently and occasionally training in quality management had to be provided.

An important feature of the project was an early recognition that in such a significant project there are many stakeholders with the power to disrupt or help the project. These included local politicians, local authorities, utility providers, neighbouring owners, trade associations, and ABSA Bank's customers and staff. The Bank's Senior General Manager responsible for properties and logistics was given responsibility for managing all the stakeholder interests. He did this by agreeing and maintaining a common shared vision of the project which took account of all the issues raised by stakeholders. This was actively explained and promoted to all project team members, so they knew how they should work and behave. In this way many sensitive stakeholder issues were identified and dealt with in a proactive, non-confrontational manner.

At the end of the project there was wide agreement between all the parties that NEC made a significant contribution to its success. This is most generally attributed to the NEC approach of requiring everyone to make decisions early and cooperate in resolving problems, so people came onto site knowing what work they were supposed to be doing to an extent that is very unusual. They will all welcome NEC being used on future projects.

Whilst the project managers walked off with 'Project of the Year 2000' awards from the Project Management Institute of South Africa, and ABSA Bank received substantial recognition for its leadership and innovation, the case study revealed that none of this would have been possible without the full support they received from all members of the professional team, the main contractor and all subcontractors.

It was a perfect demonstration of the benefits of a partnering ethos.

3 Formalised approaches to collaborative styles of working through the use of partnering techniques

The above project was completed before the NEC system included its published Partnering Option X12. The contract system in its standard form is already a system for collaborative styles of working if used as intended to be used. However with the advent of directives from clients to use formalised partnering techniques, the simple 2-page NEC Partnering Option X12 can now be included into contracts to bind the parties into obligations to use predetermined partnering techniques.

Partnering is a much-maligned concept and it is first necessary to describe what it is and how it has developed.

The UK Treasury in its Procurement Guidance Note 4 entitled “Teamworking, Partnering and Incentives”¹ describes Partnering as extending the practice of common sense team working by adding the need for a more formal structure to be agreed by the parties which

- identifies the common goals for success,
- sets out a common resolution ladder for reaching decisions and solving problems,
- identifies the targets that provide continuous measurable improvements in performance, and
- sets out gain share and pain share arrangements (incentives) where these are not included within the formal contracts.

The same Guide in its Introduction states that:

“Teamworking, partnering and incentives are not soft options that create a cosy environment to work within. They are hard nosed management techniques that deliver the aspects that are of value to the client by minimising or eliminating wasteful activities not directly contributing towards those aspects of value. They require leadership, commitment and involvement from the top down.”

4 How Partnering has developed in the Engineering and Construction Industry

First generation partnering was applied on a project-by-project basis. Practice served to define the essential elements of partnering as

- Mutual Objectives,
- Decisions Systems, and
- Continuous Improvements.

The *Seven Pillars of Partnering*² describes second generation partnering, which achieves even bigger benefits by explicitly adding a long-term strategy to a series of projects. In effect this means keeping the same teams together from one project to the next to achieve improvements which have been recorded to provide cost reductions of up to 40% and time reductions of up to 50% compared with traditional open tendering for each project.

The elements of first generation partnering were redefined for second generation partnering to:

- Strategy,
- Membership,
- Equity,
- Integration,
- Benchmarks,
- Project Processes, and
- Feedback.

¹ UK Treasury, *Procurement Guidance No. 4 Teamworking, Partnering and Incentives*. London, June 1999 available from www.hm-treasury.gov.uk

² John Bennett & Sarah Jayes, *the Seven Pillars of Partnering*, the University of Reading, UK 1998

Third generation partnering provides a mature approach in which the engineering and construction industry has adopted practices normally used in manufacturing industries. This is achieved by a group of partnering firms taking responsibility for the complete cycle of Use: Development: Production.

The key features of third generation partnering are:

- Overall Aims,
- Outputs,
- Organisation,
- Project Organisation,
- Information,
- Systems,
- Teamworking, and
- Liabilities.

Although some proponents of partnering argue there is no place in true partnering for contracts, most users will prefer to have formal contractual links, providing they do not detract from the partnering philosophy. The NEC system of standard form contracts³ now widely used in South Africa is designed to reduce adversarialism and introduce good project management into contractual arrangements. The NEC Partnering Option X12 now available, provides the formal structure identified above, and coupled with the flexibility available within the full NEC family of contracts the full benefit of a first, second and third generation approach to partnering are available.

Almost any endeavour, which requires change from state A to state B, can be identified and run as a project. The construction of a road, township infrastructure, a power station are the more obvious projects, but the same techniques can apply to the spending of an annual budget, or the parallel development of an emerging enterprise. There is no reason why the techniques of partnering cannot be applied as the tool (the way forward) for developing the construction industries of southern Africa.

5 Why Partnering?

Technological and Social Complexity

Individual technologies and social requirements have become more sophisticated and decisions about them now require teams rather than individuals. This is now widely understood, hence the wide interest in teambuilding activities throughout the construction and engineering industries. However, an even more important change is that the design, manufacture and assembly of modern engineering and construction facilities requires many different technologies. As a result large processing plants and modern buildings give rise to the most sophisticated and complex projects in which the work of many separate teams has to be coordinated.

Demanding Customers

The second fundamental change facing the construction and engineering industries is that customers have become much more demanding. International competition has forced them to look for massive improvements in efficiency. So they question every aspect of their businesses, including their investments in construction and engineering work. As a direct result, the industry faces new demands for faster completions, lower prices, more reliable quality and greater certainty. As *The Seven Pillars of Partnering* describes, major customers have taken the initiative in helping construction and engineering firms meet these new demands. The Egan Report's⁴ recommendations flow directly from the experience of these leading customers.

³ **Institution of Civil Engineers**, *The New Engineering Contract system of standard form contracts*, London.

⁴ **Report of the Construction Task Force headed by Sir John Egan**, *Rethinking Construction*, UK Department of the Environment, Transport and Regions, July 1998.

Management Reaction

Technological complexity initially led experienced project managers to concentrate on establishing milestones and providing sufficient time and resources to give teams a reasonable chance of meeting them. This approach is inevitably slow and expensive, but is the best answer so long as managers stick to the idea of independent work and individual liabilities. However, complex projects that are not well managed suffer from much higher levels of time and cost. This arises by default as projects get out of control and over-run completion dates and contract sums.

The state of the industry

The Latham Report⁵ focussed on the poor state of the UK construction industry with the aim of providing statements of best practice designed to turn the industry around. Often racked by bitter and protracted disputes and by low profit margins, it was concluded that there simply must be another way of doing business. One of the ways was the introduction of partnering designed to replace adversarial attitudes with a new approach based on practical actions, which encourage cooperative teamworking.

Why southern Africa?

Whilst there is a tendency to rightfully observe that what may be appropriate for UK is not applicable to southern Africa, careful study of the issues and solutions debated in UK soon reveals that they do have relevance in the region, perhaps to a different extent and for different reasons, but still relevant never the less. Furthermore many of the techniques can be applied directly or easily adapted to the region's unique circumstances. There has been a substantial investment in the UK based studies, reports and experimental projects, the outputs of which are freely available on web sites. There would not seem to be any benefit in 're inventing the wheel', even if we could afford to do so.

6 Partnering in practice

In the Engineering and Construction industry, partnering is commonly seen in three styles:

- Formation of a team of client representatives, consultants and contractors for the express purpose of carrying out a single 'one off' project. (First generation partnering)
- Strategic Alliance, or Framework Agreements between a client and a number of service providers who may be called upon at any time within the period of the Alliance / Framework Agreement to assist the client develop and carry out any number of projects or maintenance programmes. (Second generation partnering).
- Service providers within the industry who agree to co-operate on a network basis for the purpose of marketing their jointly developed product to prospective clients, on the basis of complete identification, design and erection into operation. (Third generation partnering)

Partnering is probably not essential or wise for all projects and is generally applied to situations where the client can gain from maximum interaction with the industry for the benefit of knowledge sharing. Clearly if the client is building a straight forward project for which he is able to procure complete designs before calling for tenders, there is not much point in setting up the additional requirements for partnering. However, the attitudes and culture arising from partnering techniques can benefit any project as was demonstrated the case study in section 2 of this paper.

In NEC terminology, partnering for a project is probably most effective if there is a tendency towards Option C in the risk and incentive spectrum. However the flexibility of the NEC system is being demonstrated in ways the drafting Panel never contemplated, and it in these niche market situations that creative service providers are using NEC to get the contracts and the success they rightfully deserve.

⁵ **Sir Michael Latham**, *Constructing the Team*, Final report of the Government / Industry review of procurement and contractual arrangements in the UK construction industry, The Stationery Office, London, July 1994.

7 Contracts obligations and liabilities

Partnering Charters

Until recently, it has been common practice to bind the members of the team with an agreed Partnering Charter. This is usually in the form of a one-page wall poster containing statements of good intent, or Apple Pie and Motherhood, as the Americans are apt to call them. Where contracts are not used, this is all the client has available when things do not proceed as he thought they would or one of the team encounters genuine cost and time problems that delay the rest of the team. However in instances where contracts are used adversarial contracts such as the FIDIC 4 Red Book are often drawn up, just in case, using the 'kept in the Drawer syndrome'. Hardly a good mix with the Partnering Charter and likely to lead to huge legal and interpretation problems if disputes arise, and the Charter is seen in some way to serve as a parallel and binding agreement between the parties.

The need for contracts

There has been endless debate about the need for contracts. Some experts suggest that partnering is not about contracts. This is partly true, since the position of one party should not be used at the expense of others and the overall project. However wide ranging surveys have concluded that, "There was almost unanimous agreement that partnering agreements should be in place early in the project and that these should be formalised and eventually merged with contracts"⁶.

The new NEC Partnering Option is that partnering agreement and becomes contractually binding by being a part of each partner's own contract with the entity paying for the work the partner is undertaking. The same agreement is used for each partner in the team. It does not create a legally binding agreement between the Partners who are not parties to the contract, with all its complications in tort and delict. Contracts using the Option place obligations on the Parties to partner in accordance the Partnering Information and to achieve stated objectives not only of the Client, but also of each other Partner as stated in the Schedule of Partners.

This approach contrasts with the multi party contract, PPC 2000 published by the UK's Association of Consultant Architects⁷. This 36 page highly legal document developed by David Mosey of Trowers & Hamlins, Solicitors is bespoke to building project partnering, and could not be used for other situations, as is the case with all NEC contracts. Each member of the team is required to enter into the same contract. Because of complications further down the procurement chain, an equally specialised form of subcontract has now been added. The issues of legal obligations of each Partner to the other, associated duties of care, and the consequences that may arise there from are beyond the scope of this paper.

8 Using the NEC Partnering Option X12

The NEC Partnering Option X12 requires the preparation of four documents, to which it makes reference. These are

- Contract Data for Option X12
- Schedule of Partners
- Schedule of Core Group Members, and
- Partnering Information

⁶ **Construction Industry Council**, *A Guide to Project Team Partnering*, London 2000.

⁷ **The Association of Consultant Architects and Trowers & Hamlins, Solicitors**, *PPC 2000*, London 2000.

When Option X12 is included into each Partner's Own Contract with the Client (usually the *Employer*) it creates obligations not only towards each other, but also to the other Partners. However the Option states that it does not create a legal partnership between Partners who are not one of the Parties in this contract.

The word Client is used in the option, as this may in some cases be a different entity to the *Employer* in the ECC or PSC contracts. For example, the *Employer* may be contracting to provide and pay something for and on behalf of an operator or end user - the Client.

Contract Data

This is included into each Own Contract when Option X12 is listed as part of the *conditions of contract* in the same way as Contract Data is entered for most other option clauses in any NEC contract.

The Client and his contact details are identified, the Client's objective is stated, and the location of the Partnering Information is stated. Contract Data cannot be changed.

Schedule of Partners

As well as the usual name and contact details, this Schedule includes each Partner's contribution to the project, his objective, joining and leaving date, key performance indicator, targets, measurement arrangements, and amount of payment if target is met or exceeded. The Schedule will be adjusted as new Partners are added and others leave when their obligations are completed.

Schedule of Core Group Members

Certain members of the partnering team, the Core Group, have additional duties to those of Partners not included in the Core Group. This Schedule simply identifies Core Group members, provides their contact details, joining and leaving date.

Partnering Information

This document states how the Partners will work together and their associated duties for partnering on the project. More detail is provided in the Guide⁸ but as a minimum, such information would include:

- Use of common information systems, sharing of offices
- Attendance at Partners' and Core Group meetings
- Participation in partnering workshops,
- Arrangements for joint design development.
- Value engineering and value management
- Risk management.
- Other matters that the Core Group manages.

Clause X12.1(1) states that "Each Partner works with the other Partners to achieve the Client's objective stated in the Contract Data and the objectives of every other Partner stated in the Schedule of Partners"

Clause X12.3(1) requires that "The Partners work together as stated in the Partnering Information"

⁸ **Bennett, J and Baird A**, *NEC and Partnering The Guide to Building Winning Teams* Thomas Telford, London July 2001.

9 Sequence of events when using NEC Partnering Option X12 for a project

The Client (or *Employer*) first selects an independent partnering facilitator, who will be responsible for ensuring that the techniques of partnering are applied correctly and efficiently. The facilitator will later conduct the partnering workshops necessary throughout the project to assure that the partnering culture is maintained as well as to smooth out any wrinkles that may arise between Partners.

The Client / *Employer* may at the same time select the project manager and any other members of the Partnering team needed in the early definition stages of the project.

The Partnering Information is developed and members of the Core Group decided. Own Contracts are developed and completed as soon as possible after each Partner joins the team.

The main Partners, and certainly the Core Group should be working together at the earliest possible stage in the project process. Probably to assist the Client / *Employer* with his business case, and outline plans. The Partnering Information could include payment procedures that are applicable before Own Contracts become effective, especially when preparing plans for a sanctioning authority where there is a risk of the project not proceeding for any reason.

The first Core Group would in addition to the Client / Employer typically include main contractor, lead designers, any specialist supplier critical to the success of the project, project manager and partnering facilitator. Projects that require structured finance agreements should also include bankers in the list of Partners.

10 Selecting the Partners for a project

This is where most clients venturing into partnering for the first time feel uncomfortable without their usual priced tenders from contractors. Whilst private sector clients may select their teams by invitation and negotiation it is more likely that even they along with public sector clients will wish to select the team on a competitive tendering basis. The main difference is that tenderers will be competing on the basis of people and resources, not on lowest price.

Potential tenderers are invited to submit proposals including the following details:

- Available resources and key people
- Indications of a will, understanding of and ability to partner
- Indication of how the tenderer proposes to achieve the client's objectives, including any suggestions for improvements that affect the final outcome.
- Completion of some form of pricing document which could become the basis for future targets
- Demonstration of proven track record of successful project completion.

This would then be followed by interviews of key senior persons in the tenderer's organisation as a test of ability and commitment.

Although initially apprehensive, clients who have made the change never look back. It should be remembered that amongst the pillars of partnering are benchmarking, feedback, and constant searching for improvements. This ensures that cosy arrangements are not allowed to take root.

Having selected the Partners, Own Contracts need to be completed once sufficient detail of the project scope is in place. The most likely main Option used in ECC contracts is Option C, Target contract with activity schedule. In the case of a single contract project, the Works Information could well be the *Employer's* business case.

11 Socio economic development

Think of a project

With the flexibility described above the possibilities for socio economic development are boundless. The following projects could be identified:

- Spending a regional annual budget for building and maintaining schools
- Setting up a national or regional road maintenance programme
- Assisting Public Works with their delivery programmes
- Airport Air Side maintenance on a term contract basis

In each case the selection process can be designed to accommodate emerging enterprises, and the objectives set can include benchmarks for the development of those enterprises.

Skills transfer

Whilst there is an emphasis on skilled and competent people forming the partnering teams there is no reason, in the Author's opinion, why socio political objectives set for procurement cannot be built into partnering arrangements. The outcome will almost certainly be more beneficial than the present bi party adversarial contractual arrangements. In this way the best available skills could be brought together with less experienced people as part of a structured pre-planned skills transfer programme, or for the on-job development of a new black owned enterprise, for example.

Interdependent Teams

Projects are no longer seen as principally comprising two independent parties, the employer represented by the project manager, and the contractor, that have different interests. Professional consultants and subcontractors are no longer seen as essentially supporting the interests of the two main parties, required, for example, to communicate only through them.

The new approach is based on bringing key people into teams which take joint responsibility for undertaking projects in ways that take account of all their various interests. Research in many industries, including the UK engineering and construction industries, shows that this is far more efficient than traditional management based approaches which fragment project teams by concentrating on defining independent responsibilities and liabilities.

Cooperative Teamwork

The speed demanded by modern customers means that project teams have to be assembled rapidly and start work fast. All the key players need to be in place as early as possible, and preferably at the inception or feasibility stage and certainly before design work starts. The key players often include, as well as the customer's representatives, financiers, urban and regional planners, design consultants, main contractor and specialist subcontractors. In practice this means that many distinct teams work together on the basis of cooperative teamwork. This requires a whole new approach from the traditional concept of design, procure, construct through the use of competitive tendering at each stage.

Teamwork brings key individuals together to make decisions by discussion and consensus. Problems are identified early so that everyone can adjust their activities to actual progress. It is common during the most intensive stages of creative work for all the key members of the team to work in a common office. For especially demanding projects, such offices have a role to play throughout most stages of the work. Communication has been found to be encouraged to a high degree in project offices, so decisions are based on a true picture about the real situation facing the project.

Searching for win-win solutions

Partnering encourages these good effects because it helps team members cooperate in searching for the best possible answers for their mutual benefit. Teams undertake the vast majority of modern engineering and construction work, and the most effective of them use partnering. The common outcomes, as described in *The Seven Pillars of Partnering*, are that effort is concentrated on effective work that delivers good value for the customer and good profits for the engineering and construction firms involved, costs are low, quality is good and projects are completed fast and on time.

12 Developing Efficiency

Keeping the team together

Once a project team has worked together on several projects, it can concentrate on achieving higher levels of efficiency by cooperating on undertaking only those activities that directly add value for the customer. The Egan Report describes this as the philosophy of lean production. This means eliminating activities that consume time and resources but make no direct contribution to producing the required facility and support services. There is often scope for improving direct design and construction activities, but the biggest improvements come from streamlining communications. There is massive scope for simplifying and eliminating paperwork, electronic communications, meetings and all the other forms of interaction used in traditional management based practice. They provide real benefits as people move away from traditional approaches by ensuring that everyone undertakes their roles and responsibilities cooperatively in the interests of the project. When these good habits are established, the formal procedures within the chosen contract system can safely be streamlined.

The selection process

Keeping the same team together for several, or indeed all, of a customer's projects may at first consideration appear to destroy competition and stifle the growth of new enterprises. Partnering requires continuous benchmarking to check efficiencies and the partnering teams are brought together in the first place by competing with others on the basis of their proven ability and track record, not on a tender price which could be distorted by market forces. Partnering firms are commonly brought together for a period of five years and then compete for renewal of their framework agreement. In this manner continuous efficiencies are achieved. Whilst keeping the same core team together, objectives could be set by the customer which require the core group to employ and develop local enterprise to agreed targets on each project.

Modern Communication

A recognition of the waste arising from formal communications in management based approaches has coincided with developments in communication technology that make it possible for people to work interactively even from remote locations. Much routine communication is best carried out this way because digital technologies dramatically reduce communication costs. This is the case for much of the communication required within well developed supply chains. Digital technologies can also be used for most communication in project teams that use established patterns of construction technologies. This is because most interface problems have been identified and solved on earlier projects, when the same team is kept together for a period of time. In such situations communication becomes largely a matter of simple exchanges of information about progress, and is much faster than traditional, procedure bound methods.

This ideal is as yet fairly unusual in construction and engineering projects, and there remain many situations where it is more efficient for people to work face-to-face. This is because creative work, tackling difficult problems, resolving disputes and similar situations benefit from using all the human senses in trying to understand each others' point of view, and so feeling confident enough to cooperate in finding the best answers. Hence the continuing use of well structured meetings, workshops, project offices and social events.

13 Ensuring that the partnering process works

Keeping the co-operative inertia going

The key to making the partnering process work lies in building and maintaining strong teams. It is advisable to begin the process at workshops away from the work place, and led by an independent facilitator. The facilitator will encourage open communication, identify character strengths and weaknesses, and identify fears or concerns an individual may have. He will also devise suitable activities throughout the course of the project for exercises to underpin co-operative working and co-operative decision-making. Most customers will benefit from the use of a partnering advisor.

Teamworking, partnering and incentives are not soft options that create a cosy environment to work within. They are hard-nosed management techniques that deliver the aspects that are of value to the customer. They require leadership, commitment and continued involvement from the top down. The independent facilitator is probably the right person to assure that the necessary inertia is always in place.

14 An example of a successful partnering project

The Afan waste water treatment works in south Wales⁹.

All of these principles of good practice came together on the new £30 million Afan waste water treatment works in south Wales. Welsh Water needed the project quickly and decided to undertake it through a well thought out partnering arrangement between themselves, design consultants, quantity surveyors, main contractor, and key subcontractors and suppliers. The outcome was a very successful project that uses an elegantly straightforward approach.

One advantage from the outset was that key people had previously worked together on a smaller project using an earlier and less well developed version of the methods used at Afan. This previous experience of working together helped the team start quickly. They began with a two-day partnering workshop facilitated by an independent firm, which set up the management structure for the project and agreed a partnering charter.

High-level specification used as the contractor's Works Information

At the initiation workshop stage the team had a statement, developed by the customer, of the project requirements in the form of a high-level performance specification. This described the volumes of wastewater to be treated and the required standards of treatment, safety requirements, restrictions on outfalls into the river, and similar essential requirements. This included the required completion date, which allowed 30 months to complete the design and construction. The customer's budget was £28m. The detailed performance statement of the customer's requirements provided the Works Information for the main contractor's NEC contract. This had the beneficial effect that there were few compensation events. Apart from the provisional sums dealing with risks, only nine compensation events were needed to deal with changes to the customer's requirements.

Project organisation.

A core team provided the engine room of decision making for the project. It consisted of four people. The manager responsible for the budget and the operations manager who runs the completed treatment works represented the customer. The other two members were the design consultant's design manager and the contractor's project manager. In addition, the quantity surveyor's commercial auditor was invited to attend core team meetings.

To emphasise the central importance of team working in partnering, it was decided to name the core team as the *Project Manager* in all the consultants, contractors and subcontractors' NEC contracts.

⁹ **Bennett, J and Baird A**, *NEC and Partnering The Guide to Building Winning Teams* Thomas Telford, London July 2001.

Within the core team, the core team leader was the contractor's project manager, and the customer's representative was the manager responsible for budget. Having the operations manager involved in the core team from the outset helped ensure that design decisions took full account of the end user's needs.

There was also a strategic team, chaired by the quantity surveyor, which consisted of the immediate bosses of the core team members. It met every three months, to take a general overview of the project, review the current earned value analysis and make any necessary strategic decisions. The strategic team was named as the *Adjudicator* in the main contracts arising from the project, but was never called on to act as *Adjudicator*.

As soon as the core team was in place, a common project office was established for the customer, design consultants and contractor. It was based in Welsh Water's offices in Swansea, which are in the same building as the design consultant's offices. Key subcontractors and suppliers were brought in as their work became central to the project.

Design, target cost and risk assessment

Early pre target value engineering studies identified cost savings of £2M, and produced a scheme that met all the customer's requirements including a firm budget of £28M. Once scheme approval had been obtained, detail design and target cost compilation progressed. Design was a team effort, and programmes were developed in parallel.

The target cost was based on measured quantities produced by the quantity surveyors from the designers' preliminary drawings, plus the results of a team review of each drawing to identify work not shown. The quantities were priced at tendered rates or rates negotiated on the basis of tendered rates. About two thirds of the target was based on tendered rates and one third on negotiated rates.

Throughout this stage, risks identified by anyone were listed in a risk register. This provided a list of just over 50 risks, including ground conditions, elements of the design still to be defined, weather, failures of design or processes, design development, planning and other approvals, environmental issues, and testing. Just before the target cost was agreed, the risks were valued and then reviewed by the core team to determine the size of the risk and the probability of it occurring.

Design and construction on site

Once the target was agreed and the main contract in place, the common project office moved to site, where construction began quickly. An important principle in staffing the project office was to create a single team that included all the expert knowledge needed to undertake the direct work, but which avoided duplication so that everyone on site had a real contribution to make to the project. Establishing a single integrated project information base reinforced this. The sense of team spirit was expressed in the sign outside the project office, which reads Afan Partnering Team, displaying the team logo, which was also included on individuals' business cards.

Time management

The NEC procedures provided an effective basis for the very detailed programme that was used to ensure that time was taken seriously by the customer, designers, contractors and subcontractors. The NEC based programme covered all stages of design, construction and commissioning, and was a major factor in ensuring that this fast track project stayed under control. Indeed, it did better than this in demonstrating considerable flexibility when the customer introduced a major change fairly late in the project.

Cost management

The contractor was paid actual costs, based on his normal accounting system, plus the fee percentage established by the contractor's tender. The accounting system was run from the common project

office on site and directly recorded all labour, materials and plant used. These actual costs were coded to the main elements and sub-elements used in building up the target cost to make cost control straightforward. The accounts were open to the core team and subject to monthly audit by the quantity surveyors to make sure there were no hidden cost problems. Also, Welsh Water's internal auditors have examined the accounts on two occasions. None of the audits picked up any significant error in the accounts. The target mechanism has allowed the core team to concentrate on looking for the most cost effective answers. The focus on proactive cost control was very necessary on this project, where firm design decisions were made close to construction being undertaken.

Quality management

The contractor was named as the *Supervisor*, in the NEC construction contract, which neatly reflects best practice quality management, where the person doing the work is responsible for quality and there is no external checking. The approach to quality control worked outstandingly well. Defects were put right as soon as they were spotted so there were very few defects at hand over. The customer and designers made occasional spot checks on the quality control paperwork, but there was no formal inspection by them of the construction work.

The result

The project was handed over to the customer on time and within budget. This performance needs to be judged against the initial time and cost targets, which were widely considered to be tough, and would not have been achieved by traditional approaches.

The project is widely seen as an outstanding success and the NEC based partnering approach is being repeated on subsequent projects. Also, the lessons are being made available by treating the Afan wastewater treatment works as one of the Movement for Innovation's demonstration projects¹⁰.

15 Conclusion

Some of the techniques of partnering have been outlined and supported by an actual example. The processes of partnering are reaching maturity and likely to become commonplace in the UK. The UK Treasury has recommended that the concepts contained within their Guidance note¹¹ be applied to all new projects. The same concepts can be used for any development project, whether in engineering and construction, manufacturing (where partnering originated in the car industry), IT projects, or regional development of an industry.

It is hoped that this paper will also provide some pointers for a way forward for a regional skills transfer and development programme.

Andrew Baird, Sandton Johannesburg
Tel + 27 11 803 3008, Fax + 27 11 803 3009, e mail bairda@iafrica.com

¹⁰ See www.m4i.org.uk for details of these demonstration projects.

¹¹ UK Treasury, *Procurement Guidance No. 4 Teamworking, Partnering and Incentives*. London, June 1999.