

Summary of lessons learned from monitoring the performance of partnering during the West Bay Coastal Defence and Harbour Improvements Scheme

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Our work includes tackling flooding and pollution incidents, reducing industry's impacts on the environment, cleaning up rivers, coastal waters and contaminated land, and improving wildlife habitats.

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Science at the Environment Agency

Science underpins the work of the Environment Agency. It provides an up-to-date understanding of the world about us and helps us to develop monitoring tools and techniques to manage our environment as efficiently and effectively as possible.

The work of the Environment Agency's Science Department is a key ingredient in the partnership between research, policy and operations that enables the Environment Agency to protect and restore our environment.

The science programme focuses on five main areas of activity:

- **Setting the agenda**, by identifying where strategic science can inform our evidence-based policies, advisory and regulatory roles;
- **Funding science**, by supporting programmes, projects and people in response to long-term strategic needs, medium-term policy priorities and shorter-term operational requirements;
- **Managing science**, by ensuring that our programmes and projects are fit for purpose and executed according to international scientific standards;
- **Carrying out science**, by undertaking research – either by contracting it out to research organisations and consultancies or by doing it ourselves;
- **Delivering information, advice, tools and techniques**, by making appropriate products available to our policy and operations staff.



Steve Killeen

Head of Science

Executive summary

The Environment Agency have carried out a study that monitored the way partner organisations worked together, during the reconstruction of Bridport Harbour, West Bay, Dorset, and its associated flood and coastal defences. The construction took place from 2002 to 2005 and was managed using an ECC (Engineering and Construction Contract) Design and Construct contract (Option C), with target price formulation and inbuilt partnering arrangements.

The original collaborative research was funded under the DTI 'Partners in Innovation' scheme and was financially supported by Defra, the Environment Agency, West Dorset District Council and Costain. Some key lessons were learned. This report, commissioned by the Environment Agency, summarises the lessons, so they can be applied by the Environment Agency and its consultants and contractors when managing similar projects in the future.

The research demonstrates how a Partnering Charter and partnering workshops can improve the partnering process. Periodic partnering workshops, with an experienced facilitator, should be held at least three times: at the beginning, middle and end of the construction period. At the end of the first workshop a non-contractual Partnering Charter should be drawn up. Further partnering workshops should be used to review achievements and plan future initiatives.

Conventional monitoring of 'hard' Partnering Charter measures such as cost and time should be complemented by independent monitoring of 'soft' Partnering Charter measures. The latter reflect issues such as communications, decision-making, openness and trust, respect and equality, leadership and sense of humour. The process of monitoring objectives in the Partnering Charter encourages parties to keep to their partnering objectives and provides a useful reminder of aspects of the site organisation that require attention.

Coastal and fluvial construction is inherently risky and major physical problems may be encountered that will test the contractual and working arrangements. The following factors will help to deliver effective partnering in such a risky construction environment:

- A positive atmosphere. This includes openness and trust, respect and equality, lack of arrogance and co-operation in problem solving and decision-making, and good relationships with suppliers and subcontractors.
- Appropriate practical aspects of team working. These include shared offices, common engineering and financial documentation, a communal filing room, correspondence open to all and weekly meetings involving everyone.
- Openness in financial matters. The approach to cost control should include open book accounting, flexibility in running the contract, early warning and compensation event meetings (with an agreed record of decisions) and quick, efficient decision-making.
- An integrated and flexible approach to design and construction programming. This facilitates any necessary re-sequencing.
- Effective design, value engineering and risk management. These involve good inter-personal relationships between designers, client and contractors, minimal

paperwork and optimal management of risk and opportunity. A weekly design team meeting helps to resolve problems and speeds up decision-making.

- Effective working with other stakeholders. This should include a permanent public information centre and a coherent site partnering team

The straightforward committed partnering arrangements described in this report enable all the organisations involved in flood defence and coast protection construction projects to achieve a positive outcome. ECC Option C provides a fair basis for partnering contracts associated with design and construct schemes. It allows considerable challenges to be dealt with directly and efficiently, generating commitments so that changes can be made as the scheme evolves, without protracted dispute.

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1 Introduction

Whilst monitoring the reconstruction of Bridport Harbour, West Bay, Dorset, and the associated flood and coastal defences, the Environment Agency led some research on the way the partners worked together. Key lessons were learned that could be applied to future partnering arrangements. The original collaborative research was funded under the DTI 'Partners in Innovation' scheme and was financially supported by Defra, the Environment Agency, West Dorset District Council and Costain (Simm 2005). This report was commissioned by the Environment Agency to summarise the lessons, so they can be applied by the Environment Agency and its consultants and contractors, when managing similar projects

Bridport Harbour serves the local fishing community and is also a holiday resort. Its reconstruction was prompted by notoriously difficult wave conditions in the harbour entrance. The historic entrance piers were close to collapse and loss of the beach to the west had exposed the sea walls and development behind them to flooding and storm damage. Following several years of public consultation, appraisal and planning, complicated funding arrangements were agreed, and an ECC (Engineering and Construction Contract) Design and Construct contract (Option C) with target price formulation and inbuilt partnering arrangements was awarded. Construction work commenced on the site in spring 2002.

The project was challenging. Some major physical problems were encountered, which tested the contractual and working arrangements. During the first winter, the part-completed West Pier suffered storm damage. The existing East Pier was found to be in poor condition, which meant the project had to be re-designed, with construction method changes and reprogramming. The introduction of Aggregate Tax and massive obstructions encountered within the seabed also contributed to cost increases. The final £18M cost of the scheme exceeded the tendered target cost by around 50% and the duration of the contract was 11 months longer than the originally programmed 24 months.

The project was completed in February 2005, and now provides a new and extended layout of piers protecting the harbour entrance, with improved coastal defences and better amenities.

2 Selection of contractual arrangements

The selected contractual arrangements were an Engineering and Construction Contract (ECC) Design and Construct contract Option C (Target Contract with Activity Schedule). This offers significant advantages to the client:

- Target price formulation provides financial incentives for the contractor to work efficiently.
- Option X12 on partnering enables the principles of partnering to be embraced by all parties.
- The form is appropriate to the Design and Construct procurement route, in which the main contractor employs designers. This allows innovation in the structural design to take advantage of the contractor's specialist knowledge, skills and preferred methods.

But ECC Option C also assists the contractor in two ways:

- Cost reimbursement arrangements ensure that all reasonable costs are met along with a tendered fee percentage.
- Compensation events allow the tendered target cost to be adjusted to take account of changes to the contract. The contractor's share on completion is calculated using percentages given in the contract of the amount by which the target is beaten or missed, and is added to or subtracted from payments as appropriate.

The clause from ECC Design and Construct contract Option M, which limits the Contractor's liability for his design to 'reasonable skill and care', should be adopted since all UK consultants are only insured for this level of liability. However, the client may wish to ask the designer to provide a collateral warranty to them, enabling them to take direct action against the designers if necessary. Any attempt to impose liability for previous design work and modelling should be avoided.

During the tendering phase, information days for interested contractors are a useful way of conveying information about the scheme and the client's objectives. The eventual tender list for Design and Construct contracts can be selected on the basis of responses to a common questionnaire and should be limited to three contractors, to avoid unnecessary expense in the tendering process.

3 Partnering workshops

Periodic partnering workshops, with an experienced facilitator, are effective at summarising where the partnering process has reached and where it should go in the future. Ideally workshops should be held at least three times: at the beginning, middle and end of the construction period

3.1 The initial partnering workshop

A pre-construction partnering workshop held at the start of the contract can help to generate a 'virtual company' amongst the various parties involved. A virtual company is as a group of individuals who:

- are all going to the same place;
- are able to understand and empathise with the pressures on one another when things go wrong.

A key outcome from this initial partnering workshop is the production of a Partnering Charter, signed by all those present. The workshop is also critical to enable those present to understand the following from the outset of the project:

- what different individuals are obliged to deliver, and to whom;
- the common destination for the project, so the whole team can celebrate success on completion;
- the need for an agreed route to the destination, so that all parties and individuals work towards communicating well, resolving disagreements positively, taking responsibility for problems and establishing trust and openness;
- the specific requirements of one party from another.

The initial partnering workshop should be followed up with further workshops during the project to review achievements and plan future initiatives.

If the overall project team is very large, it may be necessary to identify a core team and hold an initial core team workshop. However, unless the project size significantly exceeds £20 million, which is unusual for Environment Agency projects, this is unlikely to be useful. It is best to allow all key staff to be involved throughout.

3.2 The mid-term review workshop

A mid-term review workshop allows the partnering team to:

- identify how the partnering team has performed in the first half of the contract period against an agreed set of measures;
- identify key issues for the team to concentrate on during the final half of the project. These issues should be reviewed at regular progress meetings. They might include, for example:
 - maintaining control over the programme as the urgency increases and room for manoeuvre decreases;

- focusing on high quality finishing and marketing of the project;
- planning the project finish and celebration of success.

3.3 The final partnering workshop

A final workshop should be held when the majority of the construction works have been completed, but before the project team disperses. It is a good opportunity to draw together the lessons learned. It can also ensure that the partnering ethos and project momentum does not flag as the project draws to a close.

4 Monitoring the partnering ethos

Regular monitoring of the achievement of the objectives in the Partnering Charter is worthwhile.

The site team are obliged to monitor 'hard' Partnering Charter measures such as cost and time, as these are embedded in the contractual arrangements.

However it is also useful to arrange for an independent person to monitor 'soft' measures. These measures can be derived by examining the words used in the Partnering Charter. They will reflect issues such as communications, decision-making, openness and trust, respect and equality, leadership and sense of humour. An example of a questionnaire that could be completed by key staff members is shown in Figure 1. The staff members can enter their results on a spreadsheet and the results can be used to generate graphs of how the various measures vary with time.

The West Bay experience suggests that it is best to do this monitoring regularly - once a month, for example - to enable reporting to regular progress meetings.

The process of monitoring encourages parties to keep to their partnering objectives and provides a useful reminder of aspects of the site organisation that require attention.

WEST BAY PARTNERING MONITORING SHEET

We are keen to monitor the progress of the partnership and would be grateful if you could spend a few minutes completing this questionnaire. Your feedback will help us to identify ways in which we can improve communications and relationships. It will also be useful in future reporting to M4i as this project is considered to be an innovative experience that all can learn from.

Your name

Your business area

Your company

Charter Values	Please put an 'x' in the box corresponding to your opinion							Specific comments:
	SCORE	5	4	3	2	1		
Overview	How happy are you to come to work on the West Bay Project this month? Score: 5 Very happy 4 Quite happy 3 Its OK 2 Quite Unhappy 1 Very unhappy							
Communications	Have you received responses to your communications (telephone, email, letter) within the time frame expected Score: 5 Always 4 Generally 3 Sometimes 2 Occasionally 1 Never							
Communications	Was the right sort of information supplied? Score: 5 Always 4 Generally 3 Sometimes 2 Occasionally 1 Never							
Decision making	How well did the different groups work together this month to produce solutions to problems? Score: 5 Very well 4 Quite well 3 Satisfactorily 2 With some difficulty 1 Very badly							
Openness & trust	Did the partners deliver on what they said they would do? Score: 5 Always 4 Generally 3 Sometimes 2 Occasionally 1 Never							
Openness & trust	Do you feel that some people are working to a hidden agenda? Score: 5 Never 4 Occasionally 3 Sometimes 2 Generally 1 Always							
Respect & Equality	Does the formal status of individuals cause any difficulty in the partnering team Score: 5 Never 4 Occasionally 3 Sometimes 2 Generally 1 Always							
Sense of Humour	What is the "craic" like? Score: 5 Excellent 4 Good 3 Satisfactory 2 Below average 1 Poor							
Usefulness of meetings	How useful have meetings been? Score: 5 Extremely Useful 4 Valuable 3 Helpful 2 Limited 1 Waste of time							
Involvement at meetings	What was the level of involvement from those present at meetings? Score: 5 Very high 4 Good 3 Satisfactory 2 Limited 1 Poor							
	SCORE TOTAL	0	0	0	0	0	0	0

Are there any specific issues that you consider adversely affect any of the listed Charter Values?

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Do you have any other comments?

Figure 4.1 An example of a 'soft issues' monitoring sheet

5 Achieving successful partnering

Discussions amongst the West Bay team, including at partnering workshops, suggest that the following components are the most significant in achieving successful partnering in a risky construction environment.

5.1 Ethos and atmosphere

Openness and trust between team members helps during difficult times. It means that people appreciate others' points of view and concerns, and enables people to work more closely together.

Lack of arrogance (regardless of the status of individuals), with everyone dropping their guard and avoiding taking strong positions, helps to solve problems.

Working together is vital for problem solving and efficient decision-making on jointly owned issues, whether these are contractual, engineering, design, programming or public relations. The contractor should never be left with the feeling that it is his sole responsibility to sort out awkward issues. The driver behind the solutions identified should always be what is best for the scheme.

Respect and equality ensures that those involved in the project work well together for the good of the project and develop good working and inter-personal relationships. This approach includes valuing the experience of each member of the team in his or her respective field.

Good relationships with suppliers and subcontractors are important, but can be enhanced by the form of contract. The ECC Option C arrangements calculate payments on a cost reimbursement basis. This means the main contractor has nothing to gain by delaying payments to subcontractors and suppliers.

5.2 Practical aspects of team working

Shared offices between opposite numbers in the client/supervisor and contractor/designer teams are crucial, to avoid unnecessary barriers and hidden agendas.

An open book policy of common engineering and financial documentation (see below under cost control) allows team members to challenge financially sensitive issues and to develop engineering solutions to the problems that will inevitably arise. Subsidiary aspects of this can include:

- a communal filing room;
- a file of incoming correspondence, circulated to everyone in the site offices team, irrespective of their organisation.

Weekly 'all-in' meetings, open to any site person, enable immediate and interactive problem solving when issues arise.

5.3 Cost control

A cost-reimbursement based payment method provides a powerful incentive for the employer to avoid unnecessary delays by ensuring that decision-making is quick and efficient.

5.3.1 Open book accounting

Open book accounting operated by the contractor gives the project team confidence that the costs incurred are valid. All parties should have access to the supporting data for compensation events and applications for payment.

The effectiveness and efficiency of the open book accounting process are assisted by:

- employment of a full time project accountant on site to monitor, record and track invoices, orders and other transactions;
- a system for rapid access and retrieval of documents and a clear audit trail;
- a commitment by the contractor to work as efficiently as circumstances allow, so the client is comfortable that he is paying a fair price for his product.

These items are not cost-free. We suggest that employers set out such requirements clearly in tender documents, so that allowance can be made for their costs.

5.3.2 Flexibility

Flexibility in running the contractual arrangements is important. Some obligations and duties may need to be varied by agreement, as the working arrangements develop. For example under ECC Option C, only two weeks are allowed to respond to compensation event applications, which can be very restrictive. At West Bay, this procedure was extended by agreement on a number of compensation events. Extensions were especially necessary when a compensation event quotation required design work to be undertaken first. The agreed extension benefited both parties, as the contractor could then find the most cost effective design solution and submit quotations without major risk allowances.

5.3.3 Early warning meetings

Early warning and compensation event meetings proved to be a valuable tool. Agreed notes of these meetings were taken as a true record of decisions made. We recommend that such meetings are held weekly or fortnightly to enable review, updating and agreement on early warnings and compensation events as they happen. Depending on the stage of the project, these meetings could last anywhere between ten minutes and an hour. Attendance at meetings needs to be consistent even if there are difficult issues to discuss. Such meetings can take the sting out of the monthly progress meeting, because contentious items can be resolved in advance.

5.4 Programming

The contractor, supported by the designer, should closely monitor the progress of design and construction, to ensure that no part of the construction is delayed by design development.

At West Bay, an integrated design and construction programme was generated. It was updated monthly by the contractor and submitted to the client's project manager for formal acceptance.

A pragmatic approach should be adopted when major re-programming is necessary, to avoid escalating costs.

5.5 Design, value engineering and risk management

Good team relationships between designers, client and constructors are desirable to achieve useful value engineering and risk management.

The West Bay experience suggests that a very frequent design team meeting (weekly, for example) is a fundamental part of the process. Ideally it should be linked to the compensation event meetings. It's important to have open and frank discussion about forthcoming design decisions or site problems and their cost implications.

During detailed design, concepts and designs should be presented to the client, contractor and supervisor at an early stage, to ensure that they correctly interpret the design ethos and intended construction methods. Holding design meetings every week allows proposals to be regularly presented, with instant reaction and comments from the client and the contractor. This sharing of the design process ensures that:

- design solutions are realistic and economic;
- abortive design work is avoided.

Rapid and frequent presentation of designs and design approaches to the client and supervisor helps to inspire client confidence in the contractor's design team. At West Bay, it contributed to a good spirit and enhanced respect and equality between team members.

This approach enables problems to be resolved quickly with a minimum amount of paperwork. Speedy decisions are facilitated through frank discussion of the issues, and by ensuring that the right people are present to comment on the technical and commercial aspects of the design. Combining information from the client, contractor and designer enables critical decisions with major cost implications to be made in good time.

Risk management procedures during the tender and construction phases should identify both risks and opportunities. Risks can either be mitigated at source or communicated to appropriate team members.

5.6 Dealing with other stakeholders

A public information centre funded by the client and staffed by permanent officers is a highly successful way of linking with the public. It offers:

- a focal point for members of the local community and visitors to share in the scheme;
- a first line of contact for enquiries and complaints about the scheme. This avoids the disturbance and safety risk when members of the public enter the site compounds.

Involving all local stakeholders and ensuring coherence of the site partnering team can be very helpful when:

- needing to make a case for significant design and programme changes and cost increases;
- achieving agreements with planning, conservation and heritage officials.

6 Conclusions

The committed partnering arrangements for flood defence and coast protection construction projects described in this report enable all the organisations involved to achieve a positive outcome. They include open book accounting, joint working and continuous monitoring and review. ECC Option C provides a fair basis for partnering contracts associated with design and construct schemes. It allows considerable challenges to be dealt with directly and efficiently, so that partners are committed to any necessary changes as the scheme evolves, without protracted dispute.

Reference

SIMM, J.D., 2005. *Assessing the performance of partnering in a coastal engineering project at West Bay, Dorset*. Wallingford: HR Wallingford. DTI Partners In Innovation (PII) Research Project Final Progress Report EX 5071.

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Your environment is the air you breathe, the water you drink and the ground you walk on. Working with business, Government and society as a whole, we are making your environment cleaner and healthier.

The Environment Agency. Out there, making your environment a better place.

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