
**INDUSTRY
COMMISSION**

**CONSTRUCTION COSTS
OF MAJOR PROJECTS**

**Report No. 8
11 MARCH 1991**

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II CONSTRUCTION
COSTS OF MAJOR
PROJECTS

INDUSTRY COMMISSION

11 March 1991

The Honourable P J Keating MP
The Treasurer
Parliament House
CANBERRA ACT 2600

Dear Treasurer

In accordance with Section 7 of the Industry Commission Act 1989, we have pleasure in submitting to you the report on Construction Costs of Major Projects.

Until his departure from the Commission on 13 February 1991, Mr A S Cole presided on this inquiry.

Yours sincerely

M L Parker
Presiding
Commissioner

E Sieper
Associate
Commissioner

COMMISSIONER

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Acknowledgements

The Commission wishes to thank those staff members who assisted the in preparing this report. The staff team was led by Mr Garth Pitkethly and Mr Ross Wilson.

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ABBREVIATIONS

A number of abbreviations used throughout the report are listed below.

ABS	Australian Bureau of Statistics
AFCC	Australia Federation of Construction Contractors
AIRC	Australian Industrial Relations Commission
AMECON	Australian Marine Engineering Consolidated Limited
ASIC	Australian Standard Industrial Classification
BLF	Builders Labourers Federation
BWIU	Building Workers' Industrial Union of Australia
CBD	Central business district
CWAI	Confederation of WA Industry, The
DITAC	Department of Industry Technology & Commerce
FEDFA	Federated Engine Drivers and Fireman's Association of Australasia
GDP	Gross domestic product
MB-CHAA	Master Builders - Construction & Housing Association of Australia
MTIA	Metal Trades Industry Association
OECD	Organisation for Economic Co-operation and Development
PCEK	Pappas Carter Evans & Koop

<p style="text-align: center;">TERMS OF REFERENCE Construction Costs of Major Projects INDUSTRIES ASSISTANCE COMMISSION ACT 1973</p>

I, PAUL JOHN KEATING, in pursuance of my powers under Section 23 of the Industries Assistance Commission Act 1973 hereby:

1. refer the construction costs of major plant and equipment for inquiry and report within eighteen months of the date of receipt of this reference
2. specify that the Commission report on any institutional, regulatory or other arrangements subject to the influence of governments in Australia which lead to excessive construction costs for major projects or impede the efficient use of resources;
3. specify that the Commission advise on courses of action to reduce or remove these costs and inefficiencies;
4. specify the Commission have regard to the established social and environmental objectives of governments;
5. without limiting the generality of this reference, specify that the Commission have regard to and report on
 - (a) construction costs for a representative range of major projects as they compare to cost levels for similar projects in competitor countries overseas
 - (b) the relative importance of construction costs in relation to other establishment costs (eg equipment, land) of major plant
6. specify that the Commission is free to hold public hearings in advance of releasing a draft report and to take evidence and make recommendations on any matters relevant to its inquiry under this reference.

P.J. KEATING
18 October 1989

1 OVERVIEW AND FINDINGS

The evidence of high construction cost of major projects in Australia is conflicting. In some areas, notably mineral processing plant, Australian costs are comparable or better than those in other developed countries. In other areas, such as chemical and forestry products, there are cost disadvantages of around 20 per cent compared to the lowest cost developed nation. Compared to Asian economies (such as Singapore and Hong Kong), cost disadvantages of 50 per cent and higher are common.

Irrespective of Australia's costs compared to other countries, the central issue is: can we do better? In other words, is there scope for reducing cost levels and improving the efficiency of the Australian industry.

This inquiry has identified many areas where there are impediments to efficiency. Except for industrial relations, most inquiry participants from within the construction industry appear remarkably relaxed about the state of their industry. This could mean that there is nothing fundamentally wrong. It could also mean that the industry does not recognise its problems; or that it has learnt to operate within its constraints.

There are few pressures on the construction industry to do better. Most operators are confronted by the same set of conditions and the industry's output is non-traded - that is, it does not directly face the discipline of the international market. But many of its clients do. Indeed, the costs of construction can be important in determining whether a major project will proceed.

Some factors which increase construction costs - such as the costs associated with development in remote locations - are natural features that cannot be avoided. Other factors - such as labour relations and approval processes can be influenced by governments. These factors are the focus of this report.

1.1 Industrial relations

The construction industry is regarded as one of the more disputatious in Australia. In recent years, working days lost for the industry as a whole have been substantially higher than the Australian average. Excessive levels of time lost as a

result of inclement weather and safety disputes are said to characterise some parts of the industry (see Chapter 7).

Success in managing industrial relations varies significantly between sites. Some sites become notorious for disputes and lost time, while others operate without apparent problems. The difference often reflects the working relationship between the site management and employee representatives on site. A successful site relies heavily on the personal attitudes, skills and relationships of key individuals.

The industry's worst industrial relations features are exposed in high-rise building in Melbourne and Sydney. Other major projects do not experience problems to the same extent.

The industry has some characteristics that hamper industrial relations and the development of productive employer/employee relationships. Foremost among these are the fluctuations in construction activity and the temporary nature of construction sites. Largely because of these factors, most major developers rely on subcontractors in preference to employing their own permanent workforce. As a result, the loyalty of the workforce to project developers and the commitment of developers to employees is less than in other industries. An adversarial approach to industrial relations is a frequent outcome.

Institutional factors also hinder efficiency. Foremost among these is the lack of effective enforceability of agreements, either in the civil courts or within the industrial relations framework, and rigid historically based job demarcations entrenched by the exclusive craft based structure of many unions.

There are a number of options that can be considered to improve industrial relations in the construction industry. One option is to focus upon the basic characteristics of the construction industry, particularly the cyclical nature of activity and the 'impermanence' of much of construction employment. Some suggest using government capital works expenditure in a counter-cyclical fashion to smooth construction activity. However, in the Commission's view it is unrealistic to expect that governments could re-schedule capital works programs on the scale needed, or in a timely manner necessary to smooth construction activity. Some firms have, or are developing a more permanent workforce. This may result in a greater commitment by both employers and employees but, given the nature of the construction industry, the scope for firms to employ a permanent workforce is likely to be limited.

Another option is to change the structure of employee representation. This could involve a greater enterprise focus in industrial bargaining, or the introduction of more competition into the labour market. However, the construction industry is not conducive to extensive enterprise bargaining. This is because of its cyclical nature, the temporary nature of construction sites and the existence of multiple, overlapping workplaces for many enterprises. A more efficient labour market could result if there were greater competition in the supply of labour, or failing this, adequate regulation to limit abuses of market power. Given Australia's history and established labour market practices, the introduction of greater competition would be difficult.

Significant changes in industrial relations in the construction industry are being pursued as part of award restructuring. They aim to reduce restrictive work practices, introduce more flexible work arrangements and improve the commitment of the workforce to the industry. Moves to broaden job classifications to allow the flexible use of labour and provide a greater range of training opportunities will benefit both employers and employees. However, award restructuring is evolving slowly. There is some scepticism on the part of employers about the extent of the benefits and, in parts of the industry, some hostility to change.

Present moves to amalgamate unions should reduce demarcation disputes, allow more flexible use of labour, and reduce negotiation costs. However, consolidating most employees in an industry into one union could result in a powerful organisation that would further weaken employers' bargaining power.

Another option is to strengthen the bargaining position of employers. Governments, as major clients of the construction industry can play a significant role. They can insist that commitments are honoured. By negotiating site agreements for government projects which exclude undesirable practices and by establishing 'model' codes of conduct, governments could provide a lead for the industry. In September 1990, the Commonwealth Government announced a Building and Construction Industry Development Strategy in which it signalled its intention to use access to government contracts as a way of encouraging firms to adhere to a set of industrial relations principles (see Chapter 7).

The inquiry has highlighted some additional areas of industrial relations reform that are worth pursuing as part of its Building and Construction Industry Development Strategy. These are:

-
- changes to payments, such as reduced levels of pay, when pay is granted for time not worked because of inclement weather or safety problems. This would provide some protection for employees' income while reducing the incentive for unnecessary stoppages;
 - increasing the enforceability of site agreements. The Federal Industrial Relations Act (under Section 115) has a provision for the Industrial Relations Commission to certify an agreement for a fixed duration which cannot be altered, except in limited circumstances. The use of this more formalised process would help to ensure that agreements have greater certainty and can be legally enforced; and
 - greater use of productivity bonuses. Bonuses could play a wider role in encouraging increased productivity and reducing unnecessary lost time.

Improvements in industrial relations are not the sole responsibility of one party. Employers (contractors and sub-contractors), employees and unions must all play their part to reduce industrial disruption and inefficient work practices. Mutual interests need to be recognised and used to change the workplace relationship.

1.2 The approval process

Despite frequent reviews and commitments by governments to change, approval processes continue to impose an unnecessary cost burden on proponents of major projects (see Chapter 6). Existing procedures usually involve dealing with a multiplicity of Federal, State and Local government agencies, some of which have overlapping responsibilities. Conformity among governments in administrative procedures and in the standards employed is limited. In some instances, there are few publicly available guidelines.

As a result, approval processes are characterised by high levels of uncertainty. Uncertainty as to what agencies and what requirements must be satisfied; uncertainty about the time taken to obtain a decision; and uncertainty as to whether further conditions will be imposed after approval is given. Ultimately this increases project costs and decreases competitiveness.

The ‘one-stop-shop’ concept has been adopted in some States. This involves using a single agency to coordinate government bodies and to expedite the application. In Western Australia and, to a lesser extent, in South Australia, legislated agreements which override much State and local government regulation are used to facilitate applications for major projects. Provided this does not exempt major projects from compliance with warranted safeguards, this could also improve coordination. However, there is a danger that, unless effectively implemented, such practices will only add another government instrumentality to the already long list that need to be consulted. This problem could be overcome if use of the one-stop facility were optional rather than mandatory, allowing firms which can operate effectively without using it to do so.

Differences in standards and regulations among governments complicate construction and increase costs, without any apparent offsetting benefits. It is not clear, for example, why equipment certified as satisfactory for work in one state needs to be re-examined when shifted to another.

Progress in implementing unified codes and standards is slow. There is a likelihood that uniformity may never be achieved in some areas. In these circumstances, it may be more productive for governments in Australia to agree to mutual recognition of each other’s standards and regulations. This would mean that trade skills, plant and equipment meeting the requirements of one state would automatically be deemed to satisfy the requirements of all other states/territories. Recognition by governments in Australia of other developed countries’ standards would be a logical extension of this procedure.

At present, most Australian standards prescribe the way in which particular goals should be met. This leaves no freedom for industry to meet the objectives in other, possibly less costly, ways. Such difficulties could be overcome if greater use were made of performance-based standards - that is, standards that specify the objective and allow industry to comply in the most cost effective manner.

1.3 Australian participation

Australian participation in major projects in Australia is high with many projects having levels of Australian content well over 70 per cent (see Chapter 8). This is to be expected given natural local supply advantages and policies which favour local suppliers (eg tariffs and government purchasing preferences). Nevertheless, in some quarters, extra measures are advocated to increase Australian participation in major projects. This, it is said, would provide the impetus to develop an active export-oriented engineering industry in Australia that would act as a ‘springboard’ for technology-related development in the economy generally.

The Commission considers that there is little likelihood that these perceived benefits will materialise. Experience in other industries shows that exposing industries to competition provides greater incentive for adopting new technologies and increasing efficiency than measures that shelter industries from international competition.

Consideration should also be given to the costs of local content requirements. Obligations to increase local sourcing would deprive project managers of the opportunity to use lower cost overseas goods and services. Apart from price differences, local content requirements can reduce access to ‘state of the art’ technology. In addition, the perception that governments may encourage or enforce increased local participation in major projects may discourage overseas suppliers from tendering.

The Commission considers that proposals which artificially increase Australian participation jeopardise the international competitiveness of major projects. This outcome would retard the development of Australian engineering industries.

Policies that seek to direct work to contractors based in the state, or even the local government area, within which major projects are located are likely to have similar effects. These policies not only deny major projects access to lower cost international suppliers, but also to low cost suppliers elsewhere in Australia.

1.4 Project management

Given the non-recurring and complex nature of many major projects, it is reasonable to expect more cost-overruns and other management problems than in smaller, more common and less sophisticated projects. Nevertheless, concerns were expressed that major projects are not managed efficiently (see Chapter 4). The Maddock Committee found that there was a scarcity of Australian project managers capable of handling major projects and that, as a consequence, many major Australian projects are managed by expatriates. The form of contracts employed and the way in which risks are allocated among the various parties were said to also underlie many of the problems.

Fixed price, cost plus and variations of these forms of contracts are employed for major projects. Perceptions of the merits of each vary. For example, some favour fixed price contracts because more of the price risk is carried by the contractor. On the other hand, high levels of litigation, caused by contractors seeking to minimise costs at the expense of agreed quality, are commonly attributed to fixed price contracts.

Public bodies usually award fixed price contracts to the lowest priced suitable tenderer. Ensuring probity and fairness are the major benefits stemming from this policy. However, such benefits have to be weighed against costs that can arise from the limited flexibility available to governments to match the form of contract with the characteristics of particular projects and the skills of the parties involved. Proposals to move closer to commercial practices are currently being investigated by the New South Wales Government.

The Commission has found no factors which unduly impede private sector interests entering into contractual obligations. Solutions should not be sought in regulations specifying the allocation of risk. This should remain an area which can be freely negotiated. Recently, government has been involved in a joint effort with industry to develop better approaches to, and understanding of, tendering and contract processes. This will help provide information to industry on contracts. Governments should investigate the scope for applying the recommendations of that study to their own activities.

1.5 Other issues

Other factors, including infrastructure costs, interest costs, taxation arrangements, transport costs, tariffs and tariff concessions, were said to adversely affect the construction costs of major projects (see Chapter 9).

Some project developers claim that governments require them to provide excessive social infrastructure. As governments fund a range of social infrastructure and related services (eg roads, police and education facilities), major projects should generally not be expected to totally finance social infrastructure. However, as the cost of providing infrastructure to large projects, particularly those in remote areas, can exceed the cost of provision to other sectors of the community, there is a case for major projects contributing to social infrastructure.

The taxation matters raised by participants highlighted problems caused by the effects of inflation on the tax system, the incomplete inclusion of certain capital related expenditures, and the general undesirability of imposing indirect taxes (sales taxes and excise) on inputs into the production of goods and services. These matters warrant consideration by government. Some will be addressed in announced reviews of the wholesale sales tax system and into simplification of income tax in Australia.

The other factors mentioned above affect most industries to some degree. To this extent there is little reason for special treatment to be accorded construction activity. Some of the concerns are being addressed by current government inquiries into the Commercial Tariff Concession System, and areas of transport (eg road and rail).

1.6 Findings

The Commission's findings are that:

- In some areas (eg certain mineral processing projects), Australian construction costs for major projects are comparable or lower than overseas. In other areas (eg certain chemical and forest products), there are disadvantages of the order of 20 per cent compared to the lowest cost developed country.
- Capital costs for those major projects for which data were available represented about 40 per cent of the unit cost of the final product. Erection costs were around half of capital costs. Labour costs accounted for around half of erection costs.
- Industrial relations problems, particularly in the Central Business Districts of Sydney and Melbourne, and inefficient planning approval processes are the two most important factors subject to the influence of government which result in the capital costs of major projects in Australia being higher than necessary.
- Governments, being major clients of the industry, can hasten labour market reform by insisting that more efficient labour and management practices are adopted on government construction sites. Avenues for change which could be usefully explored include: reduced payment for time-off as a result of inclement weather or safety disputes; the use of Section 115 of the Federal Industrial Relations Act to increase the enforceability of site agreements; and greater use of productivity bonuses.
- Governments need to accelerate reviews of regulations, standards and associated administrative procedures so as to reduce uncertainty and delays, and reduce the costs resulting from variations in standards and regulations. Greater resort to the one-stop-shop concept, increased use of performance based standards, and mutual recognition by governments of the standards and regulations of other governments would help to reduce costs associated with obtaining necessary approvals.
- Economic efficiency will not be enhanced by policies to increase artificially the Australian content of major projects. Such policies increase costs and reduce the competitiveness of major projects.

-
- The complex and intermittent nature of major projects in Australia provide limited opportunities for acquiring project management skills. Recent initiatives involving government and the private sector seek to overcome information deficiencies about tendering and contract processes. Other than improving the management of its own projects, the Commission does not consider there is any additional role for government in improving project management skills.

2 THE INQUIRY

The Commission has been asked to report on factors which lead to excessive construction costs for major projects and to advise on courses of action to reduce these costs.¹

The terms of reference are presented on the page preceding Chapter 1.

In October 1990, the Commission released a draft report and, in December 1990, held hearings to allow public comment on that draft. Written submissions commenting on the draft report were also called for.

In preparing this report, the Commission has drawn on written submissions, information tendered at public hearings, discussions with interested parties and various published discussion and research papers. Participants who provided written submissions are listed in Appendix A.

2.1 The importance of construction costs

The construction industry is large. The value of non-residential building and engineering construction fluctuates, but was about \$21 billion in 1988-89. Activity peaked in 1989-90 and is expected to decline in 1990-91 and 1991-92 (DITAC 1990 and AFCC 1990).² Major projects - those of around \$50 million or more - represent only a small share of the number of projects, but a much greater share of the value of construction.

The construction industry is important, not only because it is a major employer of Australian resources, but also because it provides a significant input to many other industries. Consequently, improved efficiency in the construction industry can help contain costs, improve competitiveness and enhance economic development generally.

¹ The reference was sent to the Industries Assistance Commission but was transferred to the Industry Commission when it commenced operation in March 1990.

² References are listed at the end of the Report.

Construction costs can influence decisions as to whether new projects proceed. Other factors which influence new investment decisions include operating costs (eg the cost of labour and material inputs), other components of capital costs (eg financing costs and the cost of land acquisition), location, expectations about trends in domestic and world markets, and perceptions about future economic growth and political stability.

Major projects attract wide community attention. They can have a large impact on the environment, employment opportunities, regional economic growth and export earnings. With resource-based projects, debate can also arise on how the benefits, or 'resource rents', are shared among the community. In some circumstances, major projects are seen as opportunities to establish standards which will filter through to other projects and other industries (eg in labour relations and the use of new technology).

This attention can be double edged. On one hand it can attract government support, including 'fast tracking' of approval and special 'facilitating' legislation, the provision of infrastructure, royalty relief, or other financial incentives. On the other hand, it may generate considerable community hostility and consequent delays. It can also result in the introduction of controls, regulations or requirements which apply specifically to the new project.

Because of their size, the construction of major projects can involve some special features (for example, in regard to industrial relations). However, in many respects their construction is similar to that of the wider construction industry. Indeed, conditions in that industry set the basic framework for establishing major projects.

2.2 Coverage of the reference

Major construction projects and the construction industry as a whole have many common features. Thus, the Commission has not set rigid boundaries or classifications of projects covered by the inquiry. Projects that are of interest in the inquiry include; construction of non-residential buildings and factories; engineering construction; resource development projects; and public utility construction, such as power stations.

The Commission has interpreted the term 'construction costs' quite broadly, to refer to the total capital cost of establishing a facility, from the feasibility stage through to commissioning. Similarly, the Commission has not attempted to define precisely the term 'major project'. Major projects can vary in size - from \$200 million plus

for resource development projects, such as an oil-fields development, to \$30-50 million for constructing a manufacturing facility.

2.3 The Commission's approach

The Commission's policy guidelines require it to have regard to the desire of the Commonwealth Government:

- (a) to encourage the development and growth of Australian industries that are efficient in their use of resources, self-reliant, enterprising, innovative and internationally competitive;
- (b) to facilitate adjustment to structural changes in the economy and to ease social and economic hardships arising from those changes;
- (c) to reduce regulation of industry (including regulation by the States and Territories) where this is consistent with the social and economic goals of the Commonwealth Government; and
- (d) to recognise the interests of industries, consumers, and the community likely to be affected by measures proposed by the Commission.

The Commission must also report on the social and environment consequences of any recommendations it makes.

The policy guidelines, together with the terms of reference for the inquiry, require that the Commission focus on economic efficiency issues - in particular on factors that impede the efficiency of construction activity related to major projects. In this context, the focus of the inquiry is upon the framework in which commercial transactions take place. If there are impediments to the efficient operation of the market, in what ways can governments be involved to bring about better outcomes?

In considering these matters, the Commission has not attempted to examine in detail the multitude of regulations, codes and standards, industry awards and established practices that condition construction activity in Australia. Given the regional variations throughout Australia, that task is beyond the reach of any single inquiry. The Commission has broadly looked at the major phases of construction projects, from the feasibility stage to commissioning, and at the major components of construction costs, with the object of identifying impediments to efficiency in areas subject to the influence of governments. In doing so, the Commission has taken an economy-wide perspective, assessing options for change in terms of their impact on the economy and the community generally, not just on the construction industry.

2.4 Outline of issues

Considering the size of the construction industry there were very few formal submissions to this inquiry. Consequently, the Commission relied more on industry visits and discussions than normal to gain an understanding of how a complex and diversified industry operates. Features of these discussions were the sensitivity of some of the topics, notably industrial relations, and the disparity in views expressed about the local industry. These ranged from outright condemnation of the industry as inefficient, riddled with ‘rorts’ and restrictive work practices, and high cost compared with other countries, to praise of virtually all aspects of the Australian industry. Even when account is taken of the interests of those making the comments, the information gathered by the Commission is characterised by a substantial divergence of opinion on most major issues.

Construction costs of a range of major projects are compared with costs for similar projects overseas (Chapter 5). Nevertheless, the essential question is not whether construction costs in Australia are higher than costs elsewhere, but whether they are higher than they need be. Comparisons with overseas projects can, however, provide useful pointers to areas in which efficiency might be improved.

The major issues addressed in the inquiry are; project management and risk allocation (Chapter 4); building regulations and the approval process (Chapter 6); industrial relations (Chapter 7); and the question of Australian participation in major

construction projects (Chapter 8). Chapter 9 discusses some other factors, such as infrastructure provision and taxation issues, which can affect construction activity. The following chapter provides an indication of the size of the industry and briefly outlines common organisational arrangements and practices.

3 THE NATURE OF THE INQUIRY

3.1 Construction activity in Australia

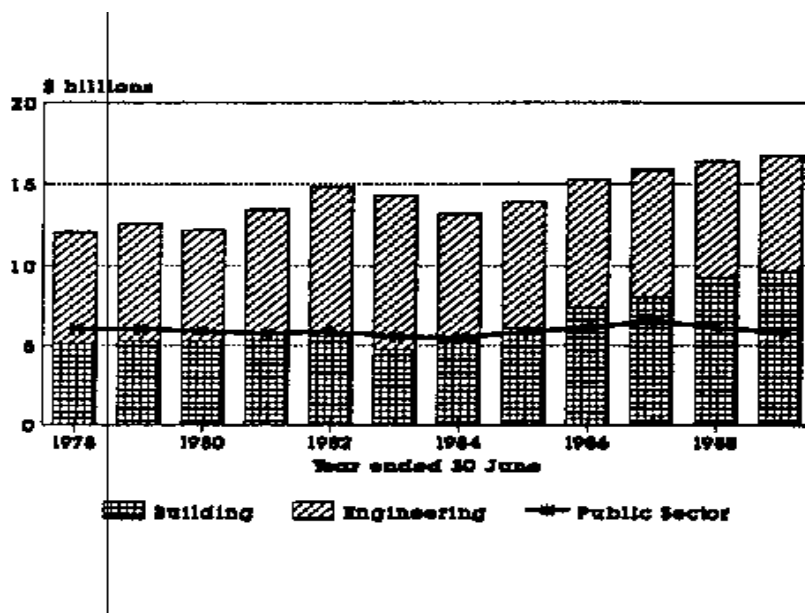
In 1988-89, the total value of construction activity was about \$37 billion. Excluding residential building (which does not fall within the present inquiry), non-residential building and engineering construction amounted to about \$21 billion, or almost 5 per cent of gross domestic product. Details of statistics showing the proportion attributable to 'major' projects are not available. For non-residential building, around 25 per cent has been associated with jobs valued at more than \$25 million.¹ Figure 3.1 shows total values of non-residential building and engineering work (together referred to as non-residential construction)² done in Australia in each year since 1977-78, expressed in constant 1984-85 values.

Building construction has been an increasing part of non-residential construction. It accounted for 57 per cent of activity in 1988-89 compared with 42 per cent in 1977-78. The elements of non-residential construction are shown for 1988-89 in Figure 3.2.

¹ Based on advice from ABS and on data published in ABS 1990c.

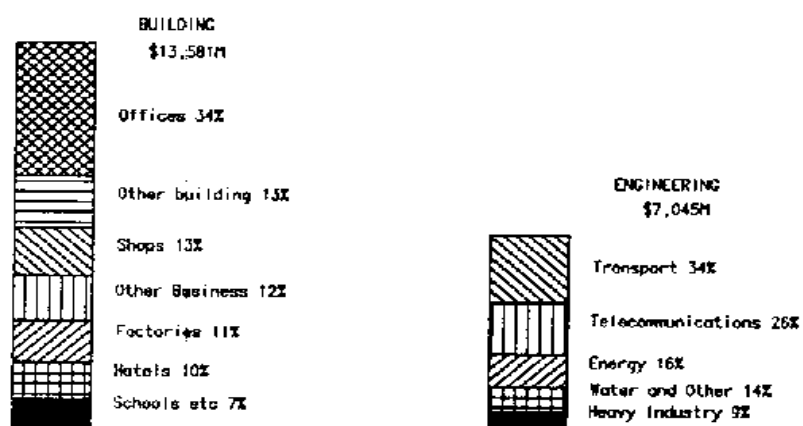
² Non-residential building includes the construction of offices, hotels, shops, hospitals, factories and schools. Engineering construction covers transport facilities such as roads, ports and bridges; dams, water and sewerage, power and communication infrastructures; and heavy industry projects such as storage and distribution facilities, refineries, mines, blast furnaces, chemical plants and steel mills.

Figure 3.1: Non-residential Construction Work Done: 1977-78 to 1988-89
Average 1984-85 Values



Source: ABS 1990d.

Figure 3.2: Type of Non-residential Construction Work Done in 1988-89

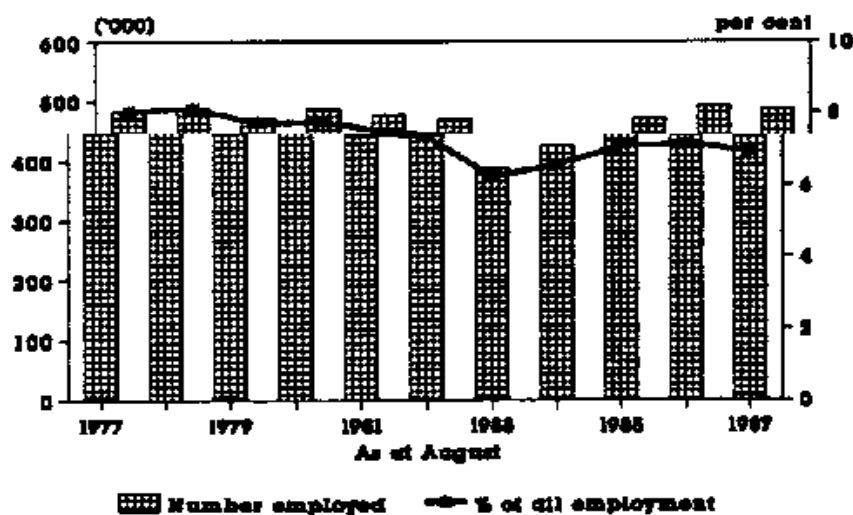


Sources: ABS 1990b and 1990e.

The value of work done by, or for, the public sector has averaged 40 per cent of the total over the last decade. Engineering construction comprises most of this public sector work. Of this, about a fifth is contracted to the private sector. In 1988-89, public sector projects represented 70 per cent of engineering construction and 23 per cent of non-residential building. Telecommunications is by far the largest part of the public sector's engineering construction - 32 per cent in 1988-89. Roads, highways and subdivisions were next in importance that year, accounting for 26 per cent. The private sector's share of engineering projects is mainly confined to heavy industry.

There has been considerable variation in the level of employment in construction in the last few years (see Figure 3.3). Employment in all types of construction peaked at 617 000 in February 1990. In May 1990, there were 574 000 people employed in the industry. DITAC (1990, p16) estimated that employment in the non-residential sector was over 350 000 at this time (including repair and maintenance and sub-contract workers).

Figure 3.3: Employment in Construction: 1977 to 1987



Source: ABS 1990f.

3.2 Outline of a construction project

The planning and management of a major construction project is complex and involves coordinating the activities of many different enterprises and groups. The skill of the project manager is paramount. As noted by Hillebrandt (1990, p 4):

Managers in the contracting business have to put together a manufacturing and assembly operation for each new project, dealing with dozens of suppliers and subcontractors. By contrast the manufacturing process, once set up, tends to be repetitive with the functions of each person well known. Not so in contracting - everything has to be worked out afresh. The process is very decision intensive.

As the complexity and cost of construction projects increase, so also do the project management skills needed and the number of firms participating in the project. A 1988 study for the Construction Industry Council³ found that, on average, each project manager was required to establish and control 23 separate contractual relationships. A typical organisational structure required for a major construction task is illustrated by Figure 3.4.

Major projects often have more than one principal. The projects involve long gestation periods and the resources to plan and fulfil them cannot always be found in any one organisation. Because of their size and the attendant risks, a joint venture (or some legal variant) is common.⁴

³ Construction Industry Council 1989. The survey covered 68 construction projects costing \$10 million or more, 42 in the public sector and 26 in the private sector; 26 of the projects were of an engineering nature and the rest building.

⁴ The Warren Centre (1985, p 66), in a survey of 42 very large Australian projects, found that in 17 the principal was a company and in 25 a joint venture. (It did not report how many of the companies had been set up specifically for the projects.)

Figure 3.4: Management for a Large and Complex Construction Project.

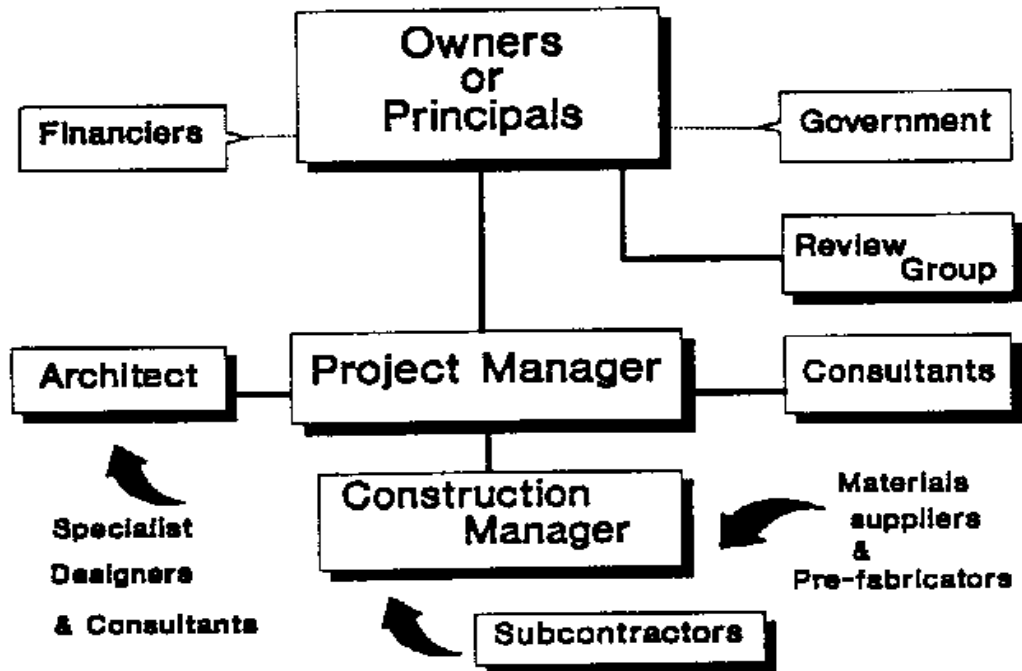
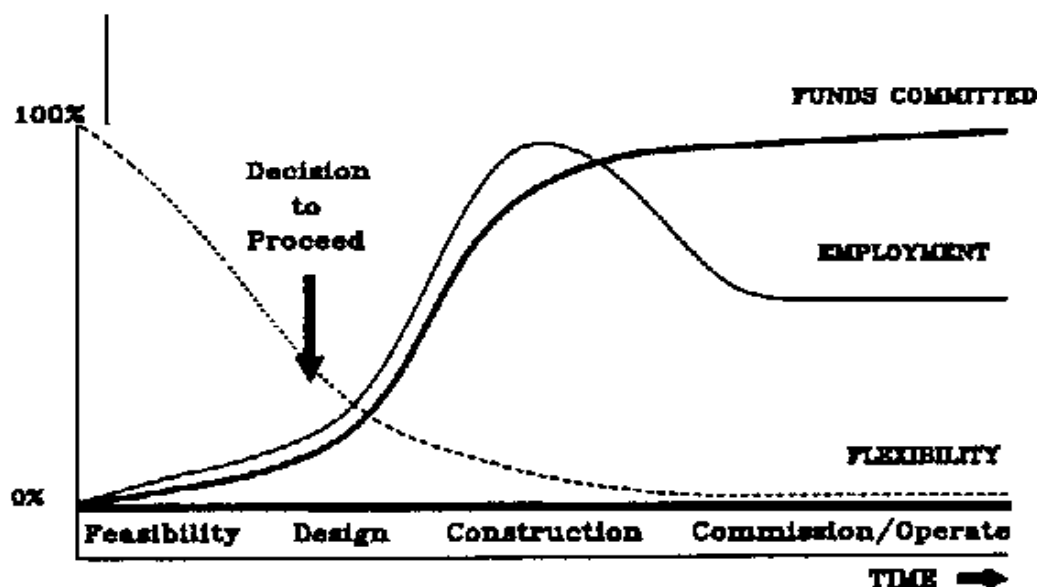


Figure 3.5 shows (in a stylized fashion) a typical sequence of events in a major project, the commitment of finance and people, and the costs of changing the plan at each stage of the project.

Once the decision is taken to conduct a full feasibility study, the principal is committed to significant expense and will normally establish a project management strategy. Co-venturers and financiers will be sought, approval processes and discussions with labour leaders and material suppliers commenced. Many experienced organisations will establish an independent group to audit the proposal and report direct to the boards of the principals.

Figure 3.5: Commitment and Flexibility in a Major Project



Source: Adapted from The Warren Centre, 1985, p 36.

The project management team enters the project early in the feasibility stage and is involved until the *project* is complete. A professional project *manager* may be hired, his exact role depending on the skills of the principal. On the other hand, an organisation familiar with major constructions might have project management skills in-house and undertake work which another principal would leave to a specialist project manager.

The major cash expenditures are committed in the construction phase. This is the phase which poses the greatest risks - the cost of failure can be very high and the costs of change in design become increasingly more prohibitive. For many major projects, a *construction manager* (responsible to the project manager) is appointed. The Maddock Committee(1989, p 2-17) found that principals of major projects who tried to manage the construction themselves ran great risks:

Managing contractors have a 90% to 100% success rate of completing projects within cost and time respectively compared to a 30% and 35% cost and time success rate experienced by owner managers. Approximately half of the projects [included in the Committee's survey] are managed by the owners.

The *construction manager* requires different skills according to the nature of the project. Many participants made the point that the construction manager needs a sound knowledge of local conditions, including the statutes and regulations, industry norms, labour traditions and participants' expectations of the project.

The prime construction contractor will typically employ only 10 per cent of on-site labour as much construction work in Australia (and also in the UK, the USA and developed countries generally), is subcontracted to specialists. Several reasons are suggested for this.

- A firm relying on its own labour force is restricted geographically in the jobs it can bid for because many employees are reluctant to work at locations remote from their homes (management of the job can more easily be moved).
- An intermittent workload can result in a permanent workforce not being fully employed in periods of low construction activity.
- Many different trades are required, but at different stages of a project. It is difficult for a contractor to keep all these trades on the pay-roll and working continuously.
- A contractor employing only a small permanent workforce can concentrate on management, needs less fixed and working capital, and gains greater flexibility in organisation and in the type, size and location of jobs that can be undertaken. Special expertise can be hired as needed.

Typically, several large unions are involved in major projects. The principal union in the building construction sector is the Building Workers' Industrial Union of Australia. The main union involved in civil engineering projects is the Australian Workers Union. The Amalgamated Metal Workers Union and the Federated Ironworkers Association are also involved, primarily in engineering construction. Appendix C provides further detail about unions and employer organisations.

4 MANAGEMENT AND RISK ALLOCATION

In the view of many participants, construction projects in Australia are not well managed. DITAC told the Commission that:

An overall assessment of the evidence indicates that the Australian construction industry is internationally competitive in many of its operations but that there are a number of areas where the industry can significantly improve its performance. These include ... management and supervision skills; project definition, feasibility and financial planning; contract management; and quality assurance.

Similarly, the Maddock Committee (1989, p2-8) found:

There is a low base of expertise available within Australia for project management and supervisory functions encompassing project control, job control, and human relations. Managing contractors confirm that there is a scarcity of Australian project managers capable of handling major projects. Many Australian projects have been and are currently being managed by expatriates.

Poor management was said to be evidenced by increased disputation and litigation about contractual responsibilities.¹ The nature of contracts employed by the industry and, in particular, the ways in which risk is allocated among parties, which are said to underlie many of these problems, are discussed in this chapter.

4.1 The formal contract

In broad terms, two forms of contract are employed in the construction industry - payment on the basis of a *fixed price* (often referred to as a *lump-sum* contract), agreed before work starts; and payment of the costs incurred by the contractor plus a fee for services (usually known as cost-plus, rise-and-fall or as a cost-reimbursable contract). Participants said that there has been a predominance of cost-*plus* contracts in recent years, but that the industry is now reverting to fixed-price contracts.

¹ National Public Works Conference and the National Building & Construction Council (1990, p1).

Under a fixed-price contract, the contractor agrees to bear any costs above the fixed price, except for those incurred because of new requests by the principal and matters outside his control. For example, the contractor would not normally bear the cost of a principal's decision to use a more expensive cladding; or of a change in the requirements of the local council.

A cost-plus contract is an agreement that the principal will pay all of the audited costs of the project plus a fee. That is, all costs incurred which are consistent with the contractor discharging contractual obligations.

There are many variants between these two basic forms of contract. For example, some parts of a fixed-price contract might be fixed in price and others subject to final design definition, and in a cost-plus contract the contractor's fee might be a fixed sum or a percentage of the final cost. Sometimes the two approaches are combined - for example in a turnkey contract arrangement, the prime contract will almost certainly be for a fixed-price; contracts between the contractor and his suppliers and sub-contractors may be cost-plus.

In principle, there is a great deal of difference between the two approaches. With a cost-plus contract, the principal ostensibly adopts nearly all price risk whereas with a fixed-price contract that risk is seemingly placed on the contractor.

Fixed-price contracts

Fixed-price contracts established after competitive tendering might be expected to produce superior outcomes. In practice, this is far from certain.

First, with a fixed-price contract, it is likely that tenderers will build contingencies into the tender price commensurate with the risks involved. Second, the costs of terminating a deficient fixed-price contract may exceed the costs of continuing the contract. This may arise where termination would jeopardise the completion date or because of the specialist capability of a poor-performing contractor (ie the difficulty of finding a replacement). It is not unknown for project managers/principals to 'carry' poorly performing contractors because the costs of enforcing the contract, particularly termination costs, are too high.

A third and common concern with fixed-price contracts is that the contractor may seek to enhance his profit by cost-cutting, building to a lower quality, or by litigious behaviour. This is commonly referred to as ‘working’ the contract. It appears to be most prevalent in periods of low demand for new construction when contractors are tempted to offer very low bids.

There is considerable evidence available from the construction industry to show that tendering firms submit unrealistically low bids, after carefully examining the documentation for errors or omissions that might form the basis for later claims. Another ploy is to seduce the client organisation into making costly additions by showing them technological advances or attractive features that were not included in the documentation. The consequent claims comprise the successful bidder’s profit margin on the project.²

The Australian Institute of Quantity Surveyors (AIQS), however, commented that:

Whilst this [working the contract] undoubtedly occurs the remedy is entirely in the Clients hands. He does not have to accept an unrealistically low bid. Equally, if Quality Assurance procedures are implemented by the Client on his tender documents this area of risk can be minimised. [Post draft report submission p.4]

The ‘solution’ suggested by the AIQS requires that clients have the capacity to recognise which bids are ‘unrealistically’ low. It also requires that clients are free to choose other than the lowest bid. In the case of government contracts, this is frequently not the case.

Cost-plus contracts

Cost-plus contracts, while seeming to place the price risk on the principal and to place little discipline on the contractor to contain costs, offer flexibility and can have advantages, particularly for the skilled project manager who can maintain close control.

² New South Wales Legislative Council Standing Committee on State Development, 1990, p14.

According to Ibbs and Ashley (1987), advantages of reimbursable contracts include:

- . lower administration costs in documentation required to define work scope and responsibilities;
- . a substantial reduction in the adversarial relationship between owners and contractors;
- . less owner effort to enforce contractual quality provisions;
- . greater flexibility to change the design or the scope of the work; and
- . easier adaptation to fast tracking.

4.2 Allocating risks and responsibilities

Ideally risk would be allocated to the party best able to manage the risk. This is largely a question of obtaining the information needed to evaluate those risks.³ If information were costless and principals and contractors therefore had access to complete information about the likelihood and possible costs of their project going wrong, then optimal loss prevention would be met irrespective of which party was assigned liability for controlling the risk. Of course, information is not costless and so responsibility should, in the first instance, be assigned so as to encourage whichever party is in the position to assemble the necessary information most efficiently to do so.

If principals can more cheaply assemble information about special characteristics of their project (for example, design) than can construction contractors, it is best if the principals accept responsibility for the risk attached to these matters. Similarly, if contractors have better or cheaper access to information about the risks of accidents arising during construction, they should accept liability for those losses. These conclusions are, however, subject to some important qualifications.

First, it will sometimes be cheaper for a principal to bear a particular risk even though the contractor can more cheaply assemble information about that risk. In these circumstances, it will be efficient for the contractor to make the information available and for principals to plan accordingly.

³ For a more detailed discussion see Industry Commission (1990).

Second, the two groups will place different values (and costs) on the various aspects of the project. Thus, even with adequate information about the risks, some will choose actions that others consider excessively risky.

Third, the costs of enforcing legal rights are important. Thus, there can be a trade-off between providing the right incentives for the provision of a service and minimising the costs of enforcing the associated legal rights.

Finally, if the incentives provided by a contract do not properly balance the benefits and costs of avoiding loss, there will be adverse impacts on such things as innovation in design. Agreement by principals to accept risk voluntarily will be particularly important for novel design. Novel designs are risky in the sense that better knowledge about possible side-effects or malfunctions is often only obtained from experience. Testing in this way therefore contributes to the adoption of innovation.

In practice, risks may not be allocated according to some rational risk assessment strategy. Differences in bargaining positions can result in one party being dominant and being able to impose terms and conditions in a non-negotiable manner.

4.3 Improving project management

With perhaps one exception (relating to the management of government projects), the Commission has not found any evidence of factors subject to control by government which unduly impede the way in which the various parties to a major project establish relationships and enter contractual arrangements.

Project management

If there is any significant general problem, it is in managing major projects. Major construction projects are often unique, at least from the client's point of view. Given that most clients would only rarely engage in a major construction, it is not surprising if they do not have highly-developed skills in management of such projects. There is little repetition to help such a principal learn how to run the project. Given the complex nature of major projects, the likelihood of failures and cost over-runs is higher than for smaller, less sophisticated projects.

Westask commented that:

Corporate management of major building developers, usually being banking, financial and insurance organisations have not a clue about project management and very seldom engage an overriding and independent project manager.

Westask also commented that resources development projects run considerably less over-budget than capital works or major building projects. It stated that resource development projects almost always have an experienced, and independent project manager conducting affairs as go-between with the owner and other project participants.

Another impediment is the relatively slow response by the education system to changes in training needs. For example, the Australian Institute of Project Management criticised the tertiary education sector as being unresponsive to new education needs saying that it was difficult to introduce new courses to train project managers. The Institute said:

One obstacle is resistance to change by old established professions and universities. They tend to perpetuate the professional categorisation and relate educational needs of the past.

Government projects

Management of government projects may be capable of improvement. The Maddock Committee (1989, p2-16) found that among the projects it studied, private sector owners experienced a 100 per cent higher success rate on their projects achieving budgets and time plans than did public sector projects. It stated:

Inadequate scope definition and incorrect pricing and quantity measurement lead to inaccurate budgets on public sector projects and are the prime reasons for many of these projects overrunning their budget and schedule...

A 1988 study - 'Time and Cost Performance of Building Contracts 1976-1980' - was conducted by the AIQS and CSIRO covering 94 private and 683 public sector contracts over \$0.5million. The study found that:

The private sector continues to out perform government sectors with projects being generally completed in 15 per cent less time, but the gap is obviously reducing.

The study indicated that government projects had a 10 per cent cost overrun compared to 6 per cent for private projects, and that government projects suffered from a 32 per cent time overrun compared to 22 per cent for private projects.

Governments, when arranging their own major constructions, have traditionally relied on their own designers and often their own construction groups. Where the actual construction is to be by an outside body, the traditional method is a public tendering process followed by the award of fixed-price contracts. As noted above, fixed-price contracts do not always lead to the best outcome.

Greater use of private sector management techniques (such as pre-qualifying tenderers) could be employed for government projects. However, given the lack of competitive or commercial discipline on public bodies, the introduction of more discretionary management systems used by private industry may not be successful. This is borne out by the AIQS/CSIRO study which found that government contracts involving restricted tender contracts took longer than projects undertaken using open tender contracts, whereas the reverse was true for private contracts.

Public bodies are, for good reason, very conscious of the need to ensure probity and fairness in dealing with potential contractors and usually award contracts to the lowest suitable tenderer. The need to follow this course limits the flexibility of government bodies as compared with the practices commonly adopted in the private sector. The New South Wales Parliament is re-examining this policy to see if it would be possible to move closer to commercial practices. In particular, it is assessing whether a 'design and construct' approach might not lead to a better result while maintaining probity and fairness.

Contracts

The management of major projects, and the mix of contracts used, changes over time. Projects are becoming larger and more complex. Quality assurance is assuming increasing prominence. There is greater use of specialists and consultants and increased dependence on professional project managers and the like. This new organisational structure may have resulted in some unfamiliarity with the allocation of risk. It will take time for the industry to develop new approaches and for legal case history defining responsibility to evolve. Nonetheless, this is happening and there is nothing to suggest a workable outcome will not eventuate.

There appears to be a belief in sections of the industry that rise-and-fall contracts are one of the causes of the industry's industrial relations problems (through encouraging firms to formalise disputes by bringing them before the Industrial Relations Commission) and that avoidance of such contracts would put pressure on firms to resist excessive wage demands and otherwise better control costs. Advocates of fixed-price contracts argue that such an approach assigns risks to the party in the best position to manage it.

The industry is already making greater use of fixed-price contracts. The Commission considers that it would be undesirable for governments to attempt to mandate the use of any particular type of contract. Firms should be free to choose the most appropriate form of contract that the conditions warrant. A 1990 study commissioned by the Department of Industrial Relations from the University of Newcastle (Report on Rise-and-Fall and Cost Reimbursement Clauses), argued that, because rise and fall clauses have advantages in some circumstances:

It would also be futile to compel the use of fixed price contracts because a reimbursement formula would simply re-emerge in a different guise.

Recently, governments have been involved in a joint effort with industry representatives to develop better approaches to, and understanding of, the tendering and contract processes. The joint working party of the National Public Works Conference and the National Building & Construction Council released its report in May 1990, titled 'No Dispute, Strategies for Improvement in the Australian Building and Construction Industry'. Among its proposals are standard approaches to contracts and codes of ethics which should enhance industry understanding.

Government construction authorities have had a major role in preparing this report and presumably intend to incorporate these proposals into their own standards for tendering, contract award and project management.⁴

Summary

In summary, there is concern in the industry to improve the quality of project management. Given their complex nature, the likelihood of failures and cost overruns is higher for major projects than for smaller, less sophisticated projects. Recent studies which define risks and obligations will help to reduce deficiencies in information. However, the Commission has found no factors which unduly impede parties entering contractual obligations. The solution should not be sought in regulations which specify the allocation of risk. This should remain an area which can be freely negotiated by the parties.

⁴ The joint working paper was chaired by a representative of Australian Construction Services and included representatives from the Building Management Authority of Western Australia; Department of Construction, Tasmania; Ministry of Housing & Construction, Victoria; and the Public Works Department of New South Wales.

5 CAPITAL COSTS AND PERFORMANCE

This chapter discusses the major elements of capital costs (Section 5.1) and the competitiveness of construction in Australia (Section 5.2). Implications of the data are discussed in Section 5.3.

5.1 Capital costs

Capital costs include all expenditure incurred in bringing a project to the production stage. They include financing and erection costs, and costs associated with planning and obtaining necessary approvals. Capital costs also include other establishment costs, such as the cost of land. However, many published studies exclude this item.

The effect which capital costs have on the competitiveness of major projects largely depends on their magnitude relative to total production costs over the life of the project. In this report, total production costs are defined as all operating costs (eg the cost of material inputs or feedstocks, operating labour etc), plus the capital costs incurred in establishing the project.

Data on the significance of capital costs for major projects in Australia are limited. However, Jaako Poyry (1986), Simons (1990) and McLennan (1990) have made estimates of the relationship between capital costs and production costs for pulp mills in Australia. McLennan Magasanik Associates (1989) made a similar study of zinc smelting and titanium dioxide plants. The studies indicated that the proportion of production costs attributable to capital costs for pulp and paper products ranges from 30 to about 50 per cent. Capital costs for zinc smelters and titanium dioxide were estimated to be of a similar magnitude.

While production costs of comparable projects vary among countries, the studies suggested the proportion accounted for by capital was broadly similar. However, for some industrialised countries such as the United States and Japan, capital costs tended to be a smaller proportion of total costs than in Australia.

The significance of capital costs relative to production costs varies with the nature of the project, its location and the technology employed. The data reported in this section of the report are based on a small sample of projects and is unlikely to be representative. However, the available data suggest that capital costs form less than 50 per cent of the total costs of production.

Elements of capital costs

The studies also provided some insight into the significance of the components of capital costs in Australia. Feasibility studies, approvals, design and management accounted for between 10 and 20 per cent of capital costs. Labour used in erection represented around 25 per cent of capital costs, while total erection costs (including labour) typically accounted for around 50 per cent. Materials and equipment accounted for 30 to 40 per cent. Where land was included, it represented about 10 per cent of capital costs.

The Commission commissioned a study, by H. A. Simons Ltd, of the capital costs of constructing a bleached hardwood kraft pulp mill in Australia, Canada and Chile (see Appendix E). The study also provided a breakdown of the elements of capital costs for the Australian project. This showed that feasibility, approvals, design and management accounted for about 10 per cent of total capital costs; labour used in erection accounted for about 22 per cent; materials and equipment about 54 per cent; and land less than 1 per cent. Other major items were working capital, and construction interest and insurance which together accounted for about 7 per cent of total capital costs.

Participants and other studies provided information on additional components of capital costs. For example, BHP Engineering indicated that infrastructure cost could be 25 to 50 per cent of capital expenditure.

Holding costs are the capitalised sum of foregone rental or production income and finance costs (including implicit costs) incurred during construction. Thus, delays in construction arising from industrial action, weather or design changes increase holding costs. Ireland (1988b) estimated that, in Australian CBD construction, increases in holding costs due to delays could add up to 40 per cent to original estimates of capital costs.

5.2 Competitiveness

Some participants argued that the capital costs of new projects adversely affect the international competitiveness of Australian industry. Published studies and submissions provide some information about Australian capital costs relative to those in other countries. Direct comparisons of capital costs are presented below; input costs are compared in the next sub-section.

Output price comparisons

The following studies undertaken since 1985 compare the cost of a range of large projects in different countries. The methodologies vary considerably between studies and there were significant exchange rate variations over the period to which the studies relate.

Forest Industries

The study commissioned from Simons and presented in Appendix E indicated that capital costs for constructing a bleached hardwood kraft pulp mill in Australia were 6 per cent higher than in Canada and 13 per cent higher than in Chile. The principal reasons for these differences were the higher cost of equipment in Australia (largely as a result of the need to import and pay duty on more equipment than Canada) and lower labour efficiency in Australia. In relation to construction labour, the study commented that differences in construction methods and practices between Canada and Australia generate 30 to 40 per cent higher manhour consumption in Australia for similar projects. Lower costs in Chile were attributable to lower site labour costs.

Jaako Poyry (1986) compared the capital costs of plant for producing forestry products in Australia with a range of competitor countries (see Table 5.1). The estimates were based on a 'model' plant, rather than existing plants. The results suggested that Australian capital costs were middle ranking. Australia had about the same capital costs as Japan, but tended to have lower capital costs than the United States. On average, the lowest cost producer of pulp and paper was Sweden which was estimated to have capital costs 15-20 per cent lower than Australia.

Table 5.1: Comparison of Capital Costs of Forest Industry Plant

Australia = 100

<i>Type of Plant</i>	<i>USA</i>							
	<i>Australia</i>	<i>New Zealand</i>	<i>USA Japan</i>	<i>West South</i>	<i>Coast</i>	<i>Canada</i>	<i>Finland</i>	<i>Sweden</i>
Softwood Pulp	100	94	91	109	105	109	80	77
Hardwood Pulp	100	94	112	112	na	na	81	78
Newsprint	100	95	102	na	121	122	86	82
SC Papera	100	94	101	na	119	na	86	82
LW Paperb	100	94	99	na	118	83	80	na
Woodfree Printing & Writing Paper	100	94	98	118	101	na	83	94
Kraft Pulp Mill	100	94	100	119	117	118	87	84

a Supercalendered magazine paper.

b Light weight coated paper.

na Not available

Source: Jaako Poyry (1986).

In a study based on Simons (1990), McLennan (1990) compared total unit costs of production of pulp and paper in Australia with costs in the United States, Canada, Chile and Brazil. For a given project, the range of ratios of capital to total costs between countries was less than five percentage points. The differences were largely in operating rather than capital costs.

Minerals Processing

The Australian Manufacturing Council (1987) concluded that capital costs are a function of location, and that Australian costs compared favourably with similar locations overseas. The study reported that cost reductions may be achieved by modular construction and by improved relations between unions and project management. On the other hand, in an opinion survey of 14 mineral industries, capital costs were identified by the study as an impediment to further processing of minerals in Australia in eight industries. In four of these industries, high capital costs were linked to environmental regulations or interest charges.

McLennan Magasanik (1989) estimated total production costs and capital costs for a standardised zinc smelter and a titanium dioxide plant. The major finding was that, given the exchange rate at the time, capital costs were not a factor inhibiting increased production in Australia (see Table 5.2).

Table 5.2: **Capital Component of Levelised Costs^a**
Australia = 100

	<i>Australia</i>	<i>USA</i>	<i>S Korea</i>	<i>Saudi Arabia</i>	<i>Europe</i>	<i>Singapore</i>
Titanium Dioxide	100	100	88	112	99	88
	<i>Australia</i>	<i>Peru</i>	<i>Mexico</i>	<i>Canada</i>	<i>India</i>	<i>Middle East</i>
Zinc	100	99	119	108	127	
Magnesium	100			107		
Aluminium	100			100		120

a Levelised cost is net present cost divided by the discounted number of tonnes of output produced over the life of the project.

Sources: McLennan Magasanik (1989) and PCEK (submission).

Pappas, Carter, Evans and Koop (PCEK) provided comparisons of the capital costs in Australia and elsewhere of an aluminium smelter and a magnesium smelter (see Table 5.2). The capital cost of a magnesium smelter in Australia was 7 per cent less than in Canada, and the cost of an aluminium smelter in Australia was 20 per cent less than the Middle East, but around the same as Canada.

CRA provided a detailed comparison of the erection costs of a mining site, net of costs arising from location and specific mining plant (eg mechanical shovels) (see Table 5.3). Australian costs were shown to be slightly less than those of the United States and close to 24 per cent higher than Malaysia. There were also differences in the components of erection costs. Malaysian costs were lower than Australia. Whereas Australian labour was argued to be more than twice as productive as Malaysian labour, wages (including on-costs) were around three times those of Malaysia.

Table 5.3: Erection Costs of a Mine

	<i>Australia</i>	<i>United States</i>	<i>Malaysia</i>
Erection Costs	100	100	81
Elements of Costs:			
- Materials	100	na	81
- Equipment	100	na	87
- Freight	100	na	42
- Labour	100	na	63

Source: CRA (submission).

Chemicals

Case studies of the costs of constructing petrochemical facilities suggest that costs in Australia are high (see Table 5.4).

Mulligan and Williams-Wynn (1989) examined the ‘cost effectiveness of constructing raw material processing plants in Australia ... with a particular focus on the petrochemical industry’. The report concluded the cost in Australia was high. Costs were said to be raised by low productivity in erection, pressure to source locally and high holding costs arising from the time taken in construction.

In a confidential component of its submission, Shell compared the cost of a petrochemical facility in Australia with Western Europe (see Table 5.4). Based on exchange rates in mid-1989, and under normal levels of economic activity, the capital cost in Australia was around 25 per cent higher, with the biggest cost disadvantage occurring in the cost of erection. The difference in erection costs reflected both the higher cost of labour in Australia and its lower productivity.

Table 5.4: Costs of Erecting Petrochemical Plants

<i>Australia</i>	<i>Europe</i>	<i>United States Gulf Coast</i>	<i>Singapore</i>	<i>Korea</i>	<i>Dubai</i>	<i>Indonesia</i>
100a	83	78	77	60	na	na
100b	79	na	na	na	na	na
100c	na	91	na	na	na	na
100d	na	115	na	na	98	103

Sources: a Mulligan and Williams-Wynn (1989, Chart 1).
 b Shell (submission).
 c Altona Petrochemical Company (submission).
 d Ammonia Plant, PCEK (1990).

The Altona Petrochemical Company provided data showing the cost of erecting a plant in Australia was about 10 per cent higher than the Gulf Coast of the United States (see Table 5.4). The largest cost disadvantage arose from lower construction labour productivity in Australia and a 9 per cent premium for locally made equipment and materials. Engineering costs, however, were estimated to be 15 per cent lower in Australia.

PCEK compared the capital costs of an ammonia plant (see Table 5.4), indicating that Australia had lower costs than the US Gulf Coast and Indonesia, but slightly higher costs than Dubai.

Commercial Building/Offices

The Confederation of Western Australian Industry compared costs for a commercial building of 48,000 m² gross floor area and 32 storeys in a city centre, and a residential building of 24 storeys and 15,400 m² using data from Rawlinsons (1988) (see Table 5.5). It indicated that Australian construction costs for commercial construction are substantially higher than costs for neighbouring Asian countries. On average, the difference in costs between Australia and New Zealand was negligible.

Rawlinsons (1991) includes data comparing building costs for several cities and various building types. The Commission converted this data to Australian dollars

and indexed the results to costs in Sydney (see Table 5.6). These data indicate that Australian construction costs for offices and hotels are significantly higher than in other developed countries except Japan. In contrast, Australian costs for industrial construction were lower than in the other countries. Australian costs are higher for high-rise buildings such as offices and hotels, and lower for the construction of light industrial and residential building.

Table 5.5: Comparison of Building Costs in Six Selected Cities
Based on \$A/m², 1988 – Sydney = 100

<i>City</i>	<i>32-storey Commercial</i>		<i>24-storey Apartments</i>	
	<i>Identical Building</i>	<i>Functionally Similar</i>	<i>Identical Building</i>	<i>Functionally Similar</i>
Sydney	100	100	100	100
Auckland	97	101	99	110
Djakarta	49	51	69	70
Hong Kong	59	69	60	71
Kuala Lumpur	47	50	58	69
Singapore	53	55	75	76

Sources: Rawlinsons (1989) and Confederation of Western Australian Industry.

Table 5.6: Comparison of Building Costs in Selected Cities
Based on \$A/m², October 1990 - Sydney = 100

<i>Country - City</i>	<i>Residential</i>	<i>Hotels</i>	<i>Industrial</i>	<i>Offices</i>
Australia-Sydney	100	100	100	100
Canada-Vancouver	94	56	106	67
Hong Kong	112	85	206	78
Japan-Tokyo	251	198	459	151
UK-London	200	79	230	-
USA-San Fransisco	111	65	138	81

Source: Derived from data in Rawlinsons (1991).

The Construction Industry Development Board of Singapore (1989) published the results of a survey of the costs (excluding land) of offices, factories, and luxury hotels. It indicated that Australian non-residential construction was generally competitive with costs in Europe and the USA, but generally more expensive than in Asian countries, other than Japan (see Table 5.7).

Summary Studies

Few studies comment on the general competitiveness of Australian construction. PCEK (1990) argued that Australia is competitive at building plants with familiar and relatively simple technology, such as aluminium smelters. In constructing more complicated plants, such as titanium dioxide or petrochemical plants, PCEK claimed Australia is less competitive in terms of capital costs.

Table 5.7: Average Unit Construction Cost
Based on cost per gross m² - Australia = 100

<i>City</i>	<i>Offices</i>		<i>Light Industry Factories</i>	<i>Luxury Hotels</i>
	<i>Quality</i>	<i>Luxury</i>		
Sydney	100	100	100	100
Perth	89	83	87	88
Auckland	83	92	89	92
London	156	172	198	155
Paris	133	137	190	na
Zurich	84	99	273	137
Copenhagen	114	143	211	147
San Francisco	96	98	187	120
Dallas	73	76	143	93
Singapore	64	75	92	84
Tokyo	179	184	332	246
Seoul	69	103	100	120
Taipei	67	73	100	87
Hong Kong	66	63	95	87
Kuala Lumpur	34	40	60	na

Source: Construction Industry Development Board of Singapore (1989).

The validity of the argument is not clear, given that the conclusion is drawn from different studies which may not be comparable. However, PCEK's argument is consistent with comments made by some participants. For example, a number of participants said that Australia was competitive in building gold leaching plants because the technology involved was relatively simple and applied often. They also expressed the view that the Australian construction industry should not expect to be competitive for projects that require technology and plant not often used in Australia.

Table 5.8: Variations in Construction Costs Due to Location
Capital City = 1.0

<i>Location</i>	<i>Relative Cost</i>
Capital City, most States	1.0
Provincial Areas	1.2 - 1.4
- Bowen (Nth Qld)	1.3
- Port Pirie (SA)	1.2
- Bunbury (WA)	1.2
Remote Areas	1.4 - 1.8
- Esperance	1.4
- Pilbara	1.55
- Kimberleys	1.7
- Weipa	1.8
- Jabiru (NT)	1.7

Source: CRA Submission.

Regional Differences in Australian Costs

CRA argued that there is substantial regional variation in construction costs. The company provided data on costs in provincial and remote areas relative to capital city costs. The scaling factors are generally larger than the margins between Australian and overseas costs (see Table 5.8).

Capital costs also vary significantly among capital cities. Table 5.9 indicates variations of up to 31 per cent. Sydney, Melbourne and Canberra are the most expensive of the capitals. The differences between these cities and other capitals are most marked for office and similar construction and least for residential construction.

The Australian Institute of Quantity Surveyors pointed out that costs are directly related to the level of economic activity at the time. AIQS commented that, in centers such as Sydney, Melbourne and the Gold Coast, construction activity had "outstripped resources and provided a fertile market for construction claims and industrial action".

Table 5.9: **Comparative Cost Index Between Cities: 1990**
Sydney = 100

City	Hotels ^a	Industrial ^b	Offices ^c	Offices ^d	Residential ^e
Sydney	100	100	100	100	100
Brisbane	80	83	72	78	96
Melbourne	110	102	110	108	95
Perth	96	86	93	94	92
Adelaide	97	95	94	98	86
Canberra	105	103	-	106	99
Darwin	100	105	-	99	-
Hobart	102	95	-	100	87

a Medium to high rise.

b Single storey.

c 21-35 stories.

d 7-20 stories.

e Medium standard - brick veneer.

Source: Rawlinsons 1991.

Input prices

Some studies have attempted to measure competitiveness by comparing the cost of major inputs (eg steel, concrete and labour) in different countries.

Boyd (1982) produced a construction price series for the mid-1970s to 1988 using a weighted sum of input prices to make international comparisons of the costs of erecting a model plant¹. The costs included labour (adjusted for productivity differences) and materials. Australia was ranked as the lowest cost country in 1987 and 1988 relative to 12 other OECD countries, and one of the lower cost countries

¹ A detailed description of Boyd's comparisons is presented in IAC (1985). The weights used by Boyd are based on an unspecified engineering construction project.

from 1975 to 1986. The change in relativities over the period is the result of the trend depreciation in the \$A from the mid 1970s, which more than offsets the higher relative rate of inflation in Australia.

Rawlinsons (1988) presented an international comparison of costs of material inputs for the construction industry. The data indicated that Australia had some of the most expensive cement and concrete aggregate of the sample. However, reinforcing steel and softwood in Australia was less expensive than overseas.

Davis, Belfield and Everest (1988) compared the \$US cost of skilled and unskilled labour in OECD and Asian countries. The study indicated that: first, Australian labour costs were more than three times the hourly rate of Malaysia, Hong Kong and Singapore; and second, Australian labour was amongst the lowest cost of the OECD countries. The lowest cost OECD country was the UK for which labour was under half the cost in Australia. Costs in the USA and West Germany were twice that of Australia. In contrast, the labour cost data provided by Boyd suggested that Australian construction labour was middle ranking among OECD countries when compared in a common currency, and that the differences between Australia, West Germany and the United States were much smaller than suggested by Davis, Belfield and Everest.

It is difficult to draw strong conclusions from the data on labour costs. There is variation in labour costs within Australia and other countries, so apparent margins may be illusory. Further, the effective cost of labour is additionally determined by its productivity, not just hourly rates of pay.

Haigh (1986)² presented time series estimates of the productivity of labour in the construction sector. The results were generally in accord with those used in other submissions and Boyd's erected cost comparisons. They indicated that Australian labour was more efficient than the UK, 10 to 20 per cent less efficient than the USA and, on average, 45 per cent less efficient than German construction labour.

Ireland (1988b) made inter-country comparisons of one aspect of productivity - time lost during construction in central business districts for a standardised building (see Table 5.10). The study split the total time taken to complete the building into time worked and time lost due to weather, industrial disputes and paid holidays. It found that delays increased the total time taken to complete a project in Australia by 63

² Quoted by the Confederation of Western Australian Industry.

per cent. Total time taken in construction in Australia was 27 per cent higher than the USA and 13 per cent higher than the UK. However, on the basis of days actually worked, Australian construction workers were about 20 per cent faster than their American and British counterparts. Ireland explained the difference in terms of delays arising from industrial disputes, weather and public holidays. A 1989, unpublished, study of CBD construction in Australia by Ireland produced results consistent with the earlier study.

Table 5.10: **Time Taken in Construction - CBD Construction**
Time worked in Australia = 100

	<i>Time Worked</i>	<i>Time Lost</i>			<i>Total Time</i>
		<i>Weather</i>	<i>Industrial Disputes</i>	<i>Paid Holiday</i>	
Australia	100	15	25	23	163
USA	119	5	-	4	128
UK	123	5	4	13	144

Source: Ireland (1988b).

5.3 Capital costs and competitiveness

There are many difficulties in comparing costs in different countries. For example, it is difficult to take account of variations in the specifications of plants, ancillary works and associated infrastructure, cost differentials attributable to location and fluctuating exchange rates. In these circumstances, international comparisons are best viewed as indicative of cost differences rather than as accurate measures of relative costs.

The cost information in this chapter points to significant variation in Australia's capital cost competitiveness relative to overseas competitors. Although generally higher than cost in Asia (other than Japan), Australian costs in some areas (eg the

processing of some minerals), are generally comparable with or better than in other developed countries. In other areas (eg chemicals and some forest products), the available information suggests that Australian capital costs are about 20 per cent higher than the lowest cost western nation.

CRA, however, commented that:

it is precisely the difference between developed and developing countries that necessitates the need for improved performance in all aspects of costs, be they capital, operating or material. The Asian countries referred to are in fact our competitors. It is these developing countries which provide the greatest threat to Australia as a location for further processing. The view that Australia is not competitive at this time is reinforced by the recent decision by China Steel to locate its A\$1.16 billion integrated steel mill in Malaysia rather than Australia - despite our competitive iron ore and coal mines.

Comparisons with other countries can be used to highlight the need to increase continuously the efficiency and competitiveness of the construction industry by identifying and reducing impediments to the effective operation of markets in Australia. However, given Australia's standard of living, it is unrealistic to expect an essentially non-traded industry to have the same cost structure, particularly labour costs, as would apply in developing countries. If Australia is to compete, it may well be because of other factors such as the level and availability of construction skills or the reduced risk provided by political stability rather than relative construction costs.

A common perception is that capital costs, especially the erection component, limit the competitiveness of production in Australia and the extent of investment. However, capital cost is only one component (usually about half) of the cost of production. Other major costs are included in operating. Thus, the influence of capital costs on competitiveness is determined by its size relative to total production costs.

Information outlined in this chapter suggests that capital costs of major projects form less than 50 per cent of the unit costs of production - typically around 40 per cent. In turn, erection costs are around 50 per cent of capital costs. These estimates suggest that a 25 per cent reduction in capital costs would lead to an overall reduction in unit production costs of about 10 per cent. A similar reduction in erection costs would result in a decline of about 5 per cent.

The data indicate that labour accounts for about one quarter of capital costs. This suggests that a 10 per cent change in labour costs in construction would change production costs by around one per cent. However, this does not include the effect on costs (eg finance costs) of stoppages during construction.

An additional difficulty in determining the impact of high construction costs is the existence of various forms of economic 'rent' in significant sectors of industry. In this context, rent is the difference between costs and sale price after payment for labour, capital, materials and risk.

In CBD construction and resource based development, rents may be dissipated in high erection costs without necessarily hindering the viability of the project. In CBD construction, the rent arises from location. That is, the value of central urban land. Increases in erection costs in the CBD can, in some circumstances, be absorbed by declines in the value of CBD land so overall capital costs of the project remain unchanged.

In resource development projects, economic rent is available in the form of returns over and above exploitation costs. Where this represents 'true' resource rent (which belongs to the community as the owner of the resources in Australia), the dissipation through higher costs represents a transfer from the community to the construction industry. While this may be an inefficient way of the community gaining its resource rent, it has little impact on whether the project goes ahead or not. However, there comes a point when the rent extracted during construction erodes the return on the risks of exploration and development of minerals to such an extent that it reduces the level of resource development.

In the non-resource based traded sectors (such as manufacturing), there is little economic rent to absorb high construction costs. Given wage relativities across the economy, high costs in some types of construction projects reduce competitiveness and production in this sector.

International comparisons can undoubtedly provide some insights into the competitiveness of Australian industry. Nevertheless, the existence of cost advantages (or disadvantages) alone does not necessarily mean that Australian construction activity is efficient, or inefficient. This is because the comparisons

also reflect differences in cost structures between countries arising from resource endowments, institutional arrangements and other factors, such as climate and location. Thus, the central issue is whether the industry is performing as efficiently as possible. This issue is pursued in subsequent chapters of the report.

6 REGULATION AND APPROVALS FOR BUILDING AND DEVELOPMENT

6.1 Introduction

Major construction projects, like most building activity, are subject to a wide range of government building and planning controls. Interventions by various levels of government are intended to protect standards of health, safety and amenity, and to manage environmental and other concerns external to the project. However, while regulations can provide benefits, they do so at a cost. There are direct costs in the form of payments for prescribed licences, authorisations, etc, and also indirect costs, such as the compliance costs associated with meeting regulatory requirements, the costs of longer construction times caused by delays in the approval process, and dynamic costs where regulation prevents innovation.

It is important that the legitimate aims of regulation are achieved in the most cost efficient manner. Participants in this inquiry endorsed the findings of several recent studies¹ that the slow processing of planning and building approvals, coupled with the excessively complex and restrictive nature of some regulation, impose unnecessary costs.

Numerous past inquiries have examined aspects of regulation of construction activities and several inquiries are in progress. Because of this inquiry's focus on major projects, some (eg those relating to residential housing) are of limited interest. Others are directly relevant to major projects:

Several State and Territory governments are reviewing the legislation governing planning and building regulation to improve its operation. For example, in February 1990 the Victorian Government's Regulation Review Unit released a Draft Report of its Inquiry into Building and Construction Regulations which is intended to provide a framework for significant reforms in that State.

¹ For example, Office of Local Government (1989), Lewis (1987) and Falk (1988).

Co-operative ventures involving Commonwealth, State and Local government are also in progress. For example:

- The Office of Local Government (within the Commonwealth Department of Immigration, Local Government and Ethnic Affairs) is planning to improve land and building development approval processes. The Local Approvals Review Program chaired by Mr Justice Rae Else-Mitchell is a major part of this process.
- The Building Regulation Review Task Force, established in 1989 by the Commonwealth Government, is reviewing procedures and processes of building and its technical, regulatory and standards framework.²
- The Australian Uniform Building Regulations Co-ordinating Council has developed a uniform code of building regulation (the Building Code of Australia) to replace existing regulatory requirements in each State and Territory. This code incorporates the greater use of regulations which allow innovation (eg performance based regulations as opposed to prescriptive regulations). It is expected to be introduced in all States and Territories by the end of 1991.

Industry bodies are also contributing to reform. For example, the National Standards Association of Australia is working to introduce uniform building standards throughout Australia.

The rest of this chapter:

briefly outlines the regulation and approval processes applying to land and building development in Australia (Section 6.2);

examines some of the problems identified in various studies and by participants (Section 6.3); and

discusses the scope for improvement (Section 6.4).

² Although the Task Force has a special interest in housing, it will review all types of building.

6.2 The regulation and approval process

Building and planning controls both deal with health, safety, amenity and environmental issues. However, there are differences in their approach.

Building regulations are broadly aimed at controlling methods of construction and the safety of buildings under construction and in use (including the health of occupants and the appearance of the building). They usually relate to physically measurable things like strength, stability, adequacy of light and ventilation. They include a plethora of controls over electricity, gas, water, sewage, lifts etc, as well as the design and construction of buildings.

Planning regulations are generally aimed at controlling the management of land, the interaction of competing land uses and the amenity of an area. Planning regulations (including environmental regulation) are more subjective than building regulations.

The authority for most building and planning controls comes from legislation passed at the State or Territory level. Overlying this is certain jurisdictional authority at the Federal level. For major projects, all three tiers of government generally have some regulatory role.

In each State, the main authority comes from the Local Government or Planning Acts. For major projects, the operation of environmental planning Acts is of particular importance. A host of other Acts (such as Health, Water, Foreshore Protection or Historic Buildings) provide authority for regulation in specific areas which overlap into the building area. The responsibility for administering these Acts is similarly fragmented amongst a multitude of government departments and agencies.

The complexity of the process is illustrated by a recent draft report into building and construction regulations in Victoria. It found that Victoria had 106 Acts of Parliament, 213 Regulations or By-laws, fourteen Ministries, over 200 State Government or Semi-Government Bodies, and some 210 Local Government Authorities involved in the regulation and approval processes (Regulation Review Unit, 1990). The report estimated that the annual cost of delays and unnecessary regulations adds about 5 per cent (or \$475 million) to the cost of building and construction in Victoria compared to that in New South Wales.

The Electricity Supply Association of Australia listed some 6 local and semi-government agencies, 24 State government bodies, 6 Commonwealth Government agencies and 4 non-government bodies which typically act in an advisory capacity or issue approvals for major projects in which its members are involved (see Box 6.1).

Box 6.1: Agencies typically associated with the approval of a new power station.

<u>State Government</u>	<u>Local and Semi-Government</u>
. Air Pollution Control	. Electricity Distribution Authority
. Shire Council	
. Commercial and Industrial Development	. State Museum
. Community Services and Ethnic Affairs	. City Council
. Education	. Rural Fires Board
. Employment and Industrial Affairs	. Coal Board
. Forestry	
. Gas and Fuel	
. Harbours and Marine	
. Health	
. Land Administration	
. Local Government	
. Main Roads	
. Mapping and Surveying	
. Mines	
. National Parks and Wild Life	
. Noise Abatement	
. Police	
. Railways	
. Tourist and Travel Corporation	
. Water Quality Council	
. Water Resources	
. Premier's	
. Primary Industries	
. Works	
	<u>Australian Government</u>
	. Transport - Aviation Branch
	. Employment Service
	. Telecom
	. Social Security
	. Customs Service
	. Industry Trade and Commerce
	<u>Non-Government</u>
	. Conservation Council
	. Institute of Advanced Education
	. Institution of Engineers, Australia
	. Chamber of Commerce

Source: Submitted by the ESAA.

The Commission's recent inquiry into recycling in Australia referred to the plethora of government agencies involved in, for example, the proposal to establish a newsprint brightening facility at Australian Newsprint Mill's plant in Albury. The

proposal requires consultation with about 10 Commonwealth, State and local government departments and agencies. The Commissioners appointed by the New South Wales Government to make recommendations relating to environmental aspects of the proposals noted that ‘...the applicant has not received assistance but rather obstruction from the government agencies in relation to developing a suitable "private" salt interception project.’

Except in the Northern Territory and the Australian Capital Territory, the administration and enforcement of building and planning controls is largely a local government activity. Authority is delegated under State Local Government or Planning Acts. The nature of this delegation varies from State to State. However, each State government has the power to over-ride local government. Whether it exercises that power is essentially a political decision. Major projects are by their nature more likely to attract this intervention.

All states and territories have broadly similar systems for administering construction industry regulation; although the level of authority and autonomy given to Ministries, semi-government bodies and Local Government Authorities varies and there are differences in the way the systems operate.

In some States there is special legislation to minimise duplication and delays in processing applications for the development of major projects. For example, in Western Australia, special ‘Agreement Acts’ have been negotiated between the Government and large project developers to over-ride a significant proportion of State and local government regulation. The agreements, which spell out the entitlements and obligations of both the State and the developer, typically cover matters such as infrastructure provision and royalty rates. The agreements do not encompass environmental issues. However, the Western Australian Department of Resources Development - which administers the agreements - usually assists developers in preparing the documentation required to comply with environmental regulation.

At local government level, there are many instruments (eg planning schemes, by-laws and codes) setting out the operational rules and criteria for regulation. The content of some of these instruments is based on state or national standards (eg the Building Code of Australia), but in others there is little conformity.

Integrated into the process of obtaining planning approvals are a variety of courts and tribunals of appeal.

6.3 Problems associated with the regulation and approval process

There is a vast array of regulations, codes and procedures which govern construction activity in each State/Territory. The Commission has not examined particular regulations, codes or standards, but has attempted to provide an overview of the system and to identify and comment on problems in three areas: planning approvals; environmental approvals; and regulations relating to standards.

Planning approvals

Many participants referred to problems in gaining approval for major projects. Most criticised the cumbersome, fragmented and inconsistent nature of the system and the variability among States. This was said to create uncertainty and delays, adding significantly to project costs. Comments by the Institution of Engineers typified the attitude of many participants:

While the Industry recognises the need for controls and regulations it also recognises that something must be done to streamline the system... With unnecessary delays of up to 18 months and additional cost of 5% of project value quoted it is obvious that there is scope for reform in the approval process.

DITAC commented:

Government policies and regulations impact on the construction sector in a largely un-coordinated, ad hoc and uncontrolled manner due to the large number of agencies involved at every level of government.

The Commission was told that, in some circumstances, delays result because government agencies require the approval of another agency which, in turn, would prefer the prior approval of the first agency.

As an example of the commercial disadvantages resulting from delayed completion, CRA estimated that a one year extension of the construction period for a notional small mine (with a 10 year life) would reduce the net present value of the mine by between \$5 and \$7 million.

Participants in the Commission's concurrent inquiry into the mining industry also pointed to costs resulting from the protracted period often required to obtain planning approval. The Victorian Chamber of Mines cited as an example a gold mining project at Bendigo. It claimed that 40 permits have been negotiated, several public exhibition periods and public hearings have occurred and over \$20 million has been spent over a ten year period, yet no commercial production has been possible. Oakbridge Limited provided another example. It stated that it took around 8 years to negotiate approval for an extension to the Newcastle Wallsend Coal Company's lease for underground mining at the Gretley Colliery.

Criticism by some participants focussed on problems caused by differences between various arms of government and between different governments. For example, the MTIA is:

concerned that differences in requirements between States and Local Government areas unnecessarily complicate and add to the cost of construction.

Three recent surveys have examined local government approval times. The surveys indicate that most approvals are dealt with in a short time. However, the system is generally unable to deal swiftly with applications for more complex developments. The surveys found that delays are most common where:

referral is required to another level of government or government authority, and requires approvals under Acts rarely used;

assessment criteria are waived or altered;

applications are made for rezonings, planning scheme alterations or subdivisions;

applications do not provide adequate or suitable information;

applications become involved in the political process at either local or State level; and

third party appeals are involved, or where applicants appeal local authority decisions.

A study by the State Chamber of Commerce and Industry of Victoria (Lewis, 1987) estimated that the increase in total building costs from delays over and above an implicit 'acceptable' level was 8 per cent. A 1988 review by Faulk estimated that delays cause an increase in holding costs of 1.3 to 1.7 per cent per month.³

Appeals against approval decisions can also cause uncertainty and delays. A recent review of appeal systems in each State and Territory has revealed a variety of courts and tribunals dealing with different aspects of development control and enforcement.⁴ Because in some States the tribunal or committee hearing appeals is unable to consider and resolve issues involving declarations, injunctions or judicial review, such issues must be determined in the Supreme Court. The review also found that the inability of a tribunal or committee hearing appeals to exercise concurrent enforcement powers results in costly and time consuming proceedings in another court.

Participants acknowledged that the appeal process is a legitimate avenue for the expression of community concern, but criticised the existing arrangements. For example, the MTIA said:

Almost anyone can object to a major construction project. The impact varies from State to State and council to council depending on the relevant by-laws and relevant appeal provisions if the Council concerned turns down an application. This can hold projects up by as much as 12 months and, while it will not cost much directly, can be sufficient to "kill" a project.

Environmental approvals

Problems with environmental approval processes perceived by participants included the inadequacy of existing guidelines, the time taken to obtain approval, the variability of environmental standards, the degree of discretion available to administrators to determine whether an environmental impact statement (EIS) is required, and the costs involved in preparing the EIS. For example, the ACEA noted:

³ ABS (1987), Goldin & Associates (1986) and Falk & Associates (1988).

⁴ Hayes and Trenorden (1990).

It is the variability of the rules and regulations between local authorities and the increasing complexity of the process of obtaining environmental approvals in an imprecise and constantly shifting framework imposed by governments which are having a major impact on the cost of many projects.

In relation to environmental standards, the Electricity Commission of New South Wales (ECNSW) said:

There is a tendency by regulatory authorities to require best practice technology in every case even though this may be in excess for what is realistically required for environmental protection in a given situation.

ECNSW said that the cost of preparing an EIS for a power station is around \$700,000 to \$1 million and that an EIS for a transmission line would typically cost between \$100,000 and \$300,000.

ACEA, echoing the views of several participants, said the environmental approval process:

is the most unpredictable cost generator in the major project field today. The politicisation of the environment arena can result in projects being delayed, deferred or abandoned after having millions of dollars spent on their designs and investigations.

Rhône-Poulenc provided details of its applications to construct an integrated gallium and rare earths processing plant in Western Australia. In its early days, at least, the project was actively sought and encouraged by both the Western Australian and Commonwealth Governments.

The Gallium plant was to be built first at a cost of about \$45 million and then the rare earths plant for about \$110 million. The economics of gallium processing were in part dependent on the erection and operation of the second plant as the two plants were designed with common areas. In brief, approvals were required:

- (a) from the Commonwealth Government's Minister for the Arts, Sport, the Environment, Tourism and Territories;
- (b) from the Commonwealth Government's Foreign Investment Review Board (this approval was dependent on a satisfactory outcome in (a) above);

(c) from the Commonwealth Government to permit duty free entry of certain feedstocks; and

(d) from the Western Australian Environmental Protection Authority and from the State's planning authorities.

The approval process started in July 1986. Item (c) was agreed on 23 October 1986. According to the company, the form of the EIS and the Environmental Review and Management Plan (ERMP) were agreed with the Western Australian Environmental Protection Agency (EPA) in June 1987. The EIS and a draft ERMP were published by the company in February 1988. The gallium part of the operation was subsequently approved (and commissioned in the first half of 1989) but, in September 1988, only one of two stages of the rare earths project was approved. A subsequent appeal by the company was dismissed.

In September 1988, Rhône-Poulenc wrote to the EPA seeking advice about a new application. According to Rhône-Poulenc, the letter was returned "with the message that the West Australian Government wanted no such letter on the EPA's files until after the State election". The company was notified in May 1989 that a new ERMP would be required and this was submitted in August 1989. In January 1990, when approval was still outstanding, the company withdrew from the proposed rare earths plant. The decision not to proceed also deprived the company of scale economies it had anticipated from joint processing for the gallium and rare earths operations. The company said that because of this, and a downturn in the gallium market, it had temporarily closed the gallium plant.

The direct cost of preparing applications had amounted to around \$2.5 million. According to the company, the final outcome was largely a result of changes in the requirements for the disposal of two by-products - radioactive uranium and ammonium nitrate.

Rhône-Poulenc was called on to deal with ever more remote (in time) and unlikely occurrences and asked to propose ways of avoiding more, and more hypothetical, occurrences.

In submissions following the release of the draft report, the EPA disputed Rhône-Poulenc's claims, and counter claims were made by Rhône-Poulenc. The Commission has not pursued the validity of the competing claims. Nevertheless,

the developments outlined above point to the complexity and delays that can be associated with seeking environmental approvals.

Towards the end of 1990, the BIE published a study into the impact of environmental assessment on major projects (BIE 1990) 'Research Report No 35, environmental Assessment - Impact on Major Projects'. The study examined the steps involved and the amount of time that Federal and state environmental processes could take, and conducted a survey of large firms to gain their views on environmental assessment in Australia.

The BIE found that delays caused by environmental approval processes constituted the most substantial cost element. In some cases the cost of delay was reported to be as high as 10 per cent of total project costs. This was considered to have substantial potential to discourage future projects. The main sources of delay were:

- the number of responsible authorities involved;
- the lack of co-ordination between responsible authorities;
- lack of uniform standards leading to conflicting demands;
- frequent unpredictable changes to the rules;
- failure of responsible authorities to observe time limits; and
- lack of resources available to responsible authorities.

Standards for buildings, plant and equipment

There was widespread criticism by participants of safety and performance standards. Variations in standards set by governments in Australia, the failure to recognise internationally accepted standards, the conservative nature of many Australian standards, the use of outmoded standards and the 'prescriptive' basis employed to specify standards were of particular concern.

Regulations applying to cranes were cited as an example of these differences and inconsistencies. A crane which has been working in one state has to be retested if it is to work in another. Similar differences exist in regulations applying to lifts and scaffolding and in registration requirements for some types of labour (eg riggers and welders).

With regard to differences between Australian and international standards, Shell claimed there are: "variations for reasons which do not obviously pertain to good engineering practice".

Shell said that in some areas (eg the Australian Structural Steel Code), Australian standards are more conservative than in other developed countries. The company stated that costs are increased by the need to respecify overseas designs to Australian standards, the design of equipment is more costly because Australian standards are more conservative and that, because Australian standards are unique, overseas suppliers are discouraged from bidding for small Australian orders. One possibility suggested by the company is to adopt the standards of Britain, United States and West Germany or, alternatively, accept standards set by the International Standards Office. Shell's assessment is that Australian design requirements may raise local design costs by up to 5 per cent.

Esso stated that when vessels such as drilling rigs and construction barges enter Australia, items such as dry chemical fire extinguishers, certain stretchers and some lighting have to be changed to comply with the requirements of the Victorian Department of Industry, Technology and Resources, even though they carry international certification.

Many of the regulations applying to construction are of a 'prescriptive' nature. In other words, they specify standards for plant and equipment intended to achieve a particular target, rather than stipulating the target and allowing firms the flexibility to design their plant or change its mode of operation so as to meet the required standard.

A recent report by the New Zealand Building Commission recommended that the New Zealand building code specify the performance criteria, but not the means by which they are met. It considered that these should be "open to innovation of new technology and practices". Performance-based regulation has been introduced in Scandinavian countries, France, Belgium and parts of the United Kingdom.

6.4 The Commission's views

As major projects have significant economic and social implications for the community it is not surprising that they are exposed to close scrutiny by governments. In the main, this involves proponents of major projects obtaining

necessary approvals and complying with a range of safety and performance standards.

The major economic rationale underpinning the approval process relates to the presence of externalities and to information deficiencies. Both can lead to outcomes contrary to the interests of the community at large. Externalities mainly concern costs which major projects can impose on others in the community - costs which are not borne by the project itself. Examples include damage to the environment and various forms of pollution. Costs stemming from inadequate information are perhaps most pronounced in safety and health aspects of buildings. For example, employees entering a building generally require that entry does not result in exposure to unexpected risks. However, because conveying the information to users can be difficult and/or conflicts with the interests of the owner of the building, users may not be able to readily acquire the necessary information.

In circumstances such as these, governments frequently intervene. This can result in the introduction of measures to ensure that major projects bear external costs, and regulations that reduce involuntary risks faced by individuals. Provided the costs of intervention are outweighed by the benefits, and other potentially low cost options (eg self-regulation) are not feasible, some form of government action is generally accepted as serving the interests of the wider community.

To avoid unnecessary costs, it is important that not only the regulations, standards and controls themselves are efficient, but also that the administrative system is as efficient as possible. Recent reviews and submissions by participants in this inquiry show that the form of intervention employed and/or the administration of the approval process frequently adds unnecessarily to costs and reduces competitiveness. In some instances, it has contributed to the abandonment of major projects.

The underlying causes of these high costs vary. Some seem to be caused by applicants - for example where the information supplied is inadequate or unsuitable. However, many appear to be attributable to shortcomings within the control of governments.

The number of current government-initiated inquiries into regulatory and related issues involving the construction industry suggest there is a general recognition by governments of the scope for improving efficiency in these areas. Areas warranting particular attention include:

Co-ordination:

Considerable delays are experienced because of the large number of government agencies involved in authorising appeals and because of 'sequencing problems' that can arise when two different areas of government each want the other to approve a request first. Many of these problems, plus those arising from duplication and overlaps between government agencies, could be avoided if one agency acted as a co-ordinating body. While not approving applications itself, the agency could liaise with other areas of governments to help process applications. This would mean that applicants would have to deal with only one government agency.

The concept of a 'one-stop-shop', which has already been adopted in some States, could in principle facilitate approvals. However, if not implemented and administered effectively, it may only add another government agency to the already long list of government instrumentalities to be consulted.

In response to the draft report, the Queensland Electricity Commission commented that:

the "one stop" concept for approvals would have the potential disadvantage of putting another party between ourselves and the "decision makers".

A solution could be to make the one-stop facility optional. Firms that have the expertise and experience to follow the procedures themselves would be able to do so, while those less familiar could use the one stop facility. The extent to which an optional facility was used would be some indication of its worth in assisting clients.

In Western Australia, and to a lesser extent in South Australia, Agreement Acts frequently apply to major projects and over-ride much State and local government regulation. This may speed up the approval process. It could also imply that much of the existing regulation is redundant or poorly administered or, alternatively, that major projects are being exempted from necessary regulation. If the former holds,

the regulations and their administration should be reviewed. If the latter view applies, the use of such Acts to by-pass regulations should be questioned.

Reform of standards:

Most project standards specify the way to achieve a particular objective rather than specifying the objective and allowing industry the flexibility to meet it in a manner that minimises costs. Over time, the objectives of prescriptive regulations frequently become unclear and are overtaken by changes in technology.

Many of these difficulties could be overcome by use of standards based on performance. Performance-based regulations, which have a clearly stated objective, can more readily accommodate technological developments and encourage innovation.

Consistency of regulations and standards:

Some progress has been made towards the introduction of more uniform regulations and standards. However, there remain considerable differences between governments in Australia. There seems little reason why different State requirements should apply to equipment such as lifts, scaffolding and cranes. Similarly, there seems to be little need for each State, or Australia as a whole, to enforce its own unique set of regulatory standards. This is not to say that there should be uniformity of all regulations and standards. In areas such as environmental standards, a uniform standard for (say) emission controls to apply to all Australian pulp and paper plants, irrespective of whether they are situated in urban areas or remote locations, may make little sense. On the other hand, it may be appropriate for all plants to be subject to some level of emission control.

While in many areas adopting uniform regulations and standards would eliminate costs associated with differences between governments, the difficulty of getting agreement on what the appropriate standards/regulations should be means that progress is inevitably slow. There is a likelihood that uniformity will never be achieved in some areas. In these circumstances, it may be more productive for States to simply agree to recognise each other's regulations. Mutual recognition would mean that, if plant or equipment meets the standards of one State, it can be

used in any region in Australia. While mutual recognition is clearly not appropriate in all areas (eg for certain environmental regulations), it would overcome difficulties in many other areas.

Gains in efficiency are also possible through: further simplification/consolidation of building planning controls; the introduction of time limits for government agencies to respond to approval applications; and the use of the private sector for certification.

While many of these issues are being addressed by one or more governments, there is a clear need for action by all relevant governments. To this end, co-ordinated reviews involving the Commonwealth and State Governments could hasten reform and help promote consistency.

7 INDUSTRIAL RELATIONS IN THE CONSTRUCTION INDUSTRY

Many employers in the industry consider that industrial relations is the key area for attaining improvements in competitiveness. The MB-CHAA said:

While some studies have shown the Australian construction industry to be efficient by international standards, all studies undertaken have identified industrial relations as the key area where further and significant improvements can be made in the efficiency of the industry. While other issues are often identified as impeding greater efficiency in the industry our poor industrial relations record is the overwhelming area for improvements in cost competitiveness.

Shell, when providing international comparisons of construction costs for a major project, commented that:

The most important reason for Australia's cost disadvantage appears to be the relatively high cost involved in the labour intensive activity of actually erecting plants in this country. In Shell's view this is to a substantial extent due to a range of labour practices which reduce productivity below its potential in Australia.

This focus on industrial relations in by no means new. In 1982, the National Construction Industry Conference began its report by saying:

The Conference agreed universally that industrial relations is the major issue facing the industry.¹

7.1 Industrial relations problems

The construction industry has traditionally been perceived as one of the more disputatious in Australia. In recent years, working days lost per thousand employees for the industry as a whole has been substantially higher than the average

¹ Holland (1982, p2).

for all Australian industries (see Table 7.1). In contrast, time lost in construction industries in the United Kingdom, the United States, West Germany and the European Community was generally less than that in the average for all industries in those countries. The data for Canada show no clear pattern.

Table 7.1. Days Lost as a Result Of Industrial Disputes in the Construction Industry: Australia, United Kingdom, USA, Germany and Canada.
Days lost per '000 employees

	<i>Australia</i>	<i>UK</i>	<i>USA</i>	<i>Germany</i>	<i>Canada EC^a</i>	
Construction						
1983	869	47	185	3	546	28
1984	274	221	56	16	466	82
1985	374	33	6	..	88	80
1986	240	18	49	..	3132	14
1987	401	15	13	..	79	11
1988b	393	na	na	na	na	na
1989b	195	na	na	na	na	na
All industries						
1983	259	158	173	4	414	72
1984	202	1128	81	226	352	439
1985	189	262	66	1	276	126
1986	202	78	109	1	610	37
1987	185	142	40	1	333	56
1988b	223	na	na	na	na	na
1989b	156	na	na	na	na	na

.. Negligible

a Average of Germany, France, Netherlands, United Kingdom, Denmark and Ireland. Data for other EC countries were not available.

b Estimated by the Commission to be on a basis consistent with ILO data for earlier years. Derived from ABS data from ABS, 6321 Table 2, 6101 Table 3.6, GRP Table SR8.

na. Not available.

Source: ILO Yearbook, 1988.

Although disaggregated data are not available, it is recognised that the level of disputes varies markedly within the construction industry. Participants stated that industrial relations problems are greatest in high-rise projects in the CBDs of Sydney and Melbourne. While there are notable exceptions, disputes on residential building and civil and engineering construction, including major projects in remote

locations, tend to be considerably less. However, the exceptions often have a high public profile and can influence decisions on whether or not to undertake major projects anywhere in Australia.

A 1987 survey of capital city construction by Ireland (1988b) provides some insights into time lost in CBD construction. The survey found that 17 per cent of days worked were lost due to industrial disputes and 10 per cent were lost due to inclement weather. Thus, the equivalent of 27 per cent of days worked (or about 21 per cent of total construction time) were lost.² By comparison, time lost through industrial disputes on city sites surveyed in the United States and the United Kingdom was close to zero, while time lost to inclement weather averaged 2.1 per cent in each country.³

In his 1987 survey, Ireland found that time lost was significantly higher in Sydney and Melbourne than in Brisbane.

Ireland also found that time lost was higher in prominent CBD sites than on other sites. Total time lost to both inclement weather and industrial disputes was 36 per cent for prominent CBD sites and 17 per cent for other sites, (Ireland 1988b, p 39). In a 1989 study, Ireland estimated that, in Sydney CBD sites, time lost to industrial disputes was 23 per cent, and to inclement weather was 21 per cent. On non-CBD sites, time lost was 15 per cent for industrial disputes and 19 per cent for inclement weather.

Participants expressed concern that there has been no reduction in time lost, particularly when negotiations under the second tier of the 1987 wage case (the 1987 National Building Industry Agreement) had included provisions aimed at abolishing payment for lost time and thus reducing the amount of time lost.

² Ireland measures time lost as a proportion of the time actually worked rather than as a proportion of the total time taken to complete the project. Thus, if 50 per cent of days worked were lost this would imply that one third of the total time taken to complete the project was not worked.

³ The figures presented by Ireland differ from official statistics for a number of reasons. First, much of the time lost calculated by Ireland is not dispute-related - notably inclement weather - and is therefore not included in official statistics. Second, official statistics relate to the whole construction sector, including housing, while Ireland's survey relates to major projects primarily in Sydney and Melbourne. These projects are said to have the highest level of time lost.

The two elements contributing most to lost time are inclement weather and safety disputes. In both cases, much of the time lost reflects a failure of workers to adhere to clear industrial agreements entered into by their unions.

Inclement weather

The most common complaint by employers was that on some sites all workers cease work when only some are affected by inclement weather. For example, it is not uncommon for rain virtually to shut down a CBD building site, even though many workers are under cover on partially completed floors. Concern was also expressed about occasions when workers are reluctant to return to work until water has dried under foot, and an 'unreasonable' attitude to when 'rain' was falling. Under existing arrangements, time off as a result of inclement weather is time off with full pay.

The 1987 second tier agreement included changes intended to result in workers directly affected by inclement weather being redeployed to sheltered areas, and work in sheltered areas continuing. However, employers contend that compliance with the new arrangements is uneven. On some sites the agreement is adhered to while, on others, the old system continues. Compliance is higher in Queensland where State branches of the relevant unions have sought to ensure that their members honour the agreement. It appears that branches in some other States have either not accepted this responsibility or are unable to ensure compliance on all sites.

Safety disputes

The level of safety on construction sites in Australia is high compared to other countries. Ireland (1986) made an early estimate of the number of fatalities as less than 0.5 per 1 000 workers per annum in Australia. This compares to 1.84 to 1.92 per 1 000 workers per annum in the USA, and 0.74 to 1.02 in the United Kingdom. In a submission to the draft report, Ireland provided more recent data from Workcare in New South Wales of 0.12 deaths per 1 000. Data from Victoria indicates a decline from 0.11 per 1 000 in 1981 to 0.04 per 1 000 in 1989 in construction (Building and Construction Industry Council 1990, p 6). Notwithstanding this very good safety record, disputes over safety issues are a major factor reducing productivity in the industry.

The 1987 National Building Agreement specifies that if a safety hazard is alleged to exist on a site, the builder will isolate the affected area while the problem is rectified. It stipulates that work will continue normally on parts of the site which are unaffected and employees from the affected areas will be available for redeployment to other areas of the site. Employers contend that, in practice, the whole site frequently stops work when only a small area is affected.

Shell said that safety issues have become the second most common type of dispute after demarcation disputes, and in some instances have been the vehicle for pursuing union objectives unrelated to the issue of safety. In its submission to the Arbitration Commission inquiry into the building industry, the construction managers for the new federal parliament house provided data which showed that 40 per cent of time lost due to industrial action was related to safety.⁴

The Victorian Government's submission said:

The incidence of OHS [occupational health and safety] disputes is ostensibly increasing although it is not certain that all disputes under this banner are, in fact, about OHS. For each of the three years in the period August 1987 to August 1990 the number of OHS disputes before the Disputes Board were 138, 311 and 326. OHS disputes over the same period accounted for 34.6, 52.5 and 53.3 per cent respectively of all disputes coming before the Board.

One reason given by a number of participants for the prominence of safety disputes is that time off during stoppages arising from breaches of site safety is usually time off with pay.

Other reported problems

A variety of restrictive work practices were reported by employers. The Industry Commission cannot substantiate these claims, nor be sure how widespread they are in the industry. Restrictive work practices were said to include:

⁴ Concrete-Holland Joint Venture, 1988, p4.

-
- . Union action to limit self-employed or labour-only subcontracting.
 - . Overmanning of a range of activities, particularly crane crews. The FEDFA which covers crane drivers and dogmen, allows limited recruitment in boom times and ‘closes the books’ in construction downturns. In downturns, the union also is said to insist on different manning arrangements to maintain jobs for crane crews. Recently, with the decline in construction activity, pressure has been put on sites for up to 4 crane drivers to be allocated to a crane.
 - . The payment of an additional two hours to crane drivers to be in position in the crane. Employers said that it would seldom take more than ten minutes to climb the tower.
 - . Workers being prevented from doing work which they are able and willing to do because others claim that it is ‘their work’. This often relates to occupations within the one union. Employers see this as featherbedding - aimed at having two workers where only one is required.
 - . The refusal of workers to carry out tasks for which they are qualified.
 - . Limits on the number of floors workers will walk up (four), even though this is in work time.
 - . One-in, all-in demands for overtime.
 - . ‘Excessive’ over-award payments on major construction sites. Evidence was provided in confidence of total annual wages for crane drivers of between \$130 000 and \$160 000 per annum, with dogmen earning \$100 000.
 - . Bomb hoaxes on construction sites. The AFCC commented that ‘Bomb hoaxes are irregular in their occurrence but on some projects in Sydney it has not been uncommon for at least two hoaxes per week to occur during some periods’.

In a joint submission by the Building Workers Industrial Union of Australia (BWIU), the Federated Engine Drivers Association of Australia (FEDFA), and the Operative Plasterers and Plaster Workers’ Federation of Australia (OPPWF), the unions said that the extent of lost time is unfairly blamed on the workforce.

Many contractual arrangements allow for compensation for both cost and time in regard to down time caused by 'industrial problems', which act as an incentive to misrepresent the reasons for down time and the amount of down time.

'Industrial problems' are also used as a cover up for the incompetencies of management, the structural inefficiencies in the industry ... and the failure to properly plan and co-ordinate. (p12)

The problems of time lost were nonetheless acknowledged by the unions. In their joint submission they said:

However despite our scepticism we acknowledge that the question of lost time is a problem and that serious efforts have to be made to address it.

Also, in an address to the BWIU National Conference in September 1990, the National Secretary, said that 'the current situation cannot be accepted as reasonable' and that 'no one, not even including the militant BWIU, can support this situation'. He also said:

The BWIU's sound and reasonable policies in respect of wet weather, safety, honouring of agreements, bomb scares, homers, are being abused by a small group of individuals whose objectives are to gain as much paid time off work as possible.⁵

The Victorian Government pointed to the contribution of poor management practices to industrial relations problems in the industry.

The costs of industrial disputes are usually blamed on workers and unions. However many sites experience problems due to the lack of industrial relations and human management skills of the site management and supervisory staff. Some sites have appalling industrial relations records due almost exclusively to the attitudes of some workers on those sites. But many of the worst sites suffer from industrial relations problems due to the poor human management, industrial relations and communication skills of managers and supervisors.

7.2 Characteristics of the industry contributing to industrial relations problems

The construction industry has a number of characteristics that make industrial relations particularly difficult. These are, the cyclical nature of activity and the

⁵ McDonald (1990b, p21).

temporary nature of construction sites. As a consequence, the workload of individual builders and their demand for labour, can be quite variable. Construction teams are thus temporary groupings put together for a particular project. New working relationships need to be established for each site. Compared to other industries, there is limited scope to establish a stable working relationship.

The temporary nature of sites and of work relationships, together with the cyclical nature of construction activity, result in a casual and itinerant workforce with little long-term loyalty to companies. Similarly, the incentive for employers to 'look after' employees is diminished. From the employees' point of view, there is an incentive to extract high payments in good times and, in bad times, to prolong jobs and then leave the industry.

A response to this variability has been the high level of subcontracting in the construction industry in Australia. This is also the case in the USA and the UK but not in Europe where permanent employment by the principal contractor is more common. In the Australian industry, direct employment by the principal contractor can be as low as 10 to 15 per cent of people on-site.

Subcontracting takes two broadly different forms. 'Permanent' subcontracting firms which employ workers under award conditions, and self-employed individual subcontractors who may seek work individually or through employment agencies (sometimes called 'body-hire' agencies).

According to participants, unions aim to minimise the amount of work subcontracted and to encourage the builder to engage more day labour. For example, the Electricity Supply Association of Australia said:

Subcontracting to small firms is generally disliked by unions because it weakens their control and if not properly handled can give rise to safety problems. Labour only subcontracting is particularly frowned upon.

In response to the Commission's draft report, the joint union submission commented:

How can the industry produce both horizontal (broad based skills) and vertical skills (more highly skilled and career paths) when the industry is dominated by sub-contractors who contract for Tayloristic contracts?⁶

⁶ Tayloristic work organisation refers to the narrow specialisation of labour.

How can management co-ordinate and plan as well as come up through the ranks with hands on experience when the industry is so dominated by subcontractors. Both workers and management are being alienated as a result of this structural problem.

A few major building firms operate with a large directly employed permanent workforce and rely significantly less on subcontractors. Companies such as Civil and Civic, and Grollo may directly employ up to half the workers on site. Concrete Constructions also indicated that it intends to employ a much larger share of the site workforce than at present. However, these companies are primarily involved in CBD building where there is a more continuous stream of work of a broadly similar nature. Each of the companies has an established reputation which helps to ensure a more stable work flow. In contrast, the diverse and irregular nature of work involved in major projects undertaken outside the CBD reduces the incentive for builders to have a large permanent workforce.

The MB-CHAA argued that the lack of permanence has led to the establishment of industry funds for long service leave, redundancy and superannuation. The MB-CHAA said:

The creation of these funds has introduced a further barrier to positive industrial relations due to the perception that it is the fund, rather than the employer, with whom the employee should be bonded.

Construction projects have characteristics that provide particular scope for opportunistic behaviour.⁷ This hinges on the large capital costs that are committed to major projects with very limited alternative use once committed. Labour may be a small part of total project costs, but withdrawal of labour has a large effect on costs. While holding-costs vary with progress on site, costs in excess of \$100 000 per day are not uncommon on larger sites. The construction project is particularly vulnerable towards completion when considerable funds are committed. It is often cheaper for the employer to concede in a dispute rather than incur further holding costs.

Project managers, recognising the costs of delays and that working relationships with the union have to be maintained, not only to complete the current project but to successfully undertake new projects, are in a weak bargaining position. In the absence of alternative supplies of labour, the normal constraint on such

⁷ The possibilities for opportunistic behaviour where significant capital has been committed with limited alternative use is discussed in, Klein, Crawford and Alchian, 1978.

opportunistic behaviour - namely the loss of future business - has little impact on a union. As a consequence, employers are unable or reluctant to enforce site agreements and act against breaches of law.

The cyclical nature of construction activity and the temporary nature of construction sites do not mean that chronic industrial relations problems are inevitable. For example, the housing sector is cited as having a low level of disputes and as being very efficient with high productivity based on informal multi-skilling and payment by results. Unionisation in the housing sector is quite low - around 20 to 30 per cent. This reflects the relatively small scale of activity on most sites, its geographic dispersion and cost considerations.

From the unions' point of view, the concentration on large projects and on the CBD is essentially a response to resource limitations. Large sites are easier to monitor, and offer greater membership coverage compared with spreading resources over a large number of small sites. Large sites also tend to have a larger proportion of wage employees attached to the major building firms and the larger subcontractors.

Union power has been bolstered by an effective 'no-ticket, no-start' rule on all major CBD sites and indeed, on most major projects in Australia. This situation reflects a strong campaign by the building unions in the late 1970s to ensure that all subcontractors on site were union members and that award wages and conditions applied to all workers on site. This campaign was largely in response to an increase in self-employed subcontracting in the building industry.

Two other factors have contributed to the complexity of industrial relations in the construction industry. First, the industry had, until recently, favoured the extensive use of rise and fall provisions in building contracts. Labour cost increases which were the result of changes in award conditions were regarded as 'legitimate' costs to be passed on to the client. Second, the industry was also characterised by paid rates awards, which specified the actual rates to be paid rather than the more common minimum rates awards which allow over-award payments. Together these features resulted in considerable effort being directed towards having disputes processed through the Industrial Relations Commission and having all changes in conditions and allowances included in award provisions so that the cost could be legitimately passed on to the client through the rise and fall provisions of the contract. This was one factor which contributed to the decision of the Industrial Relations Commission to change the construction industry awards to minimum rates awards in 1989.

This industrial relations climate has, over time, ‘institutionalised’ an adversarial relationship which pervades both management and unions, not necessarily at the peak levels, but at the site level where agreements are implemented and where disputes originate. The Industry Commission received many comments that workable agreements could be reached at the ACTU Federal secretary level, but that site agreements are negotiated at the State level, and that the day to day working relationship depends on on-site organisers who have a considerable degree of autonomy. Concrete Constructions commented on ‘the inability of union leadership to commit members in the field to a course of action agreed at the leadership level’.

Managers are not powerless to influence the nature of industrial relations on construction sites. In fact, they can have a very important role in determining a project’s success. However, success in managing industrial relations varies significantly between sites. Some sites become notorious for disputes and lost time, while others operate without apparent problems. According to participants, the difference reflects the working relationship between the site management and employee representatives on site - a successful site relies heavily on the personal attitudes, skills and relationships of key individuals.

In this regard, Concrete Constructions commented that:

Responsibility for the industry’s performance does not lie in one area - all parties have shared in the proliferation of poor practices and all must share in the difficult task of fundamental reform.

7.3 Current changes in industrial relations in the construction industry

The industrial relations and training changes being introduced in the construction industry are part of economy-wide changes in these areas. They have two linked elements. The first is the amalgamation of awards and the development of broader job classifications, including career paths and formal skills training (see Appendix C). The second is the amalgamation of unions aimed at the creation of one principal union in each industry, including the construction industry.

Award rationalisation and training proposals

The core of the award rationalisation proposals in the construction industry involves amalgamating the three on-site construction awards into one, and the rationalisation of relativities with the National Metal and Engineering Construction Industry Award.⁸ The negotiations also include the amalgamation of the three plumbing awards. These changes, which are currently before the Industrial Relations Commission, are expected to become operative in March 1991.

Proposed changes to job classifications involve the establishment of nine broad pay scales covering both labourers and tradesmen. Subject to the availability of positions, it is envisaged that workers can progress up this career path by completing formal training modules and by competency assessment.

Increased formal training and the accreditation of skills is central to the new proposals. Apart from a handful of one-off modules, little formal off-site training is currently available for non-trades workers. Workers employed at trade level are deemed to need, in most cases, a four year apprenticeship. In fact, more than half the building workers employed and paid as tradespeople have not undergone any relevant formal training.⁹

Four broad skill streams classifying current occupations are being developed as a framework for training, accreditation and career paths in the industry. These streams are broader than the current classifications and cut across some existing union demarcations. The streams are: structures; internal finishes and fit-out; mechanical services (covering such things as air conditioning, lifts, electrical work and plumbing); and civil/operating (covering earthworks, road making and the like).

⁸ The three awards are:

National Building Trades Construction Award:

National Building and Construction Industry (FEDFA) Award; and

National Building and Construction Industry On-Site (Labourers) Award.

⁹ AFCC (1990, p.2)

It is envisaged that a worker will reach a basic level of proficiency in the broad range of skill within a stream leading to a greater degree of multi-skilling of the workforce. Workers will also be able to develop some specialised skills to a higher degree.

For the employer, multi-skilling is seen as a way of easing around many demarcations, allowing the more flexible use of labour. Despite an 'in-principle' commitment to award restructuring, there is a degree of scepticism about whether real gains can be made because of the poor record of workplace compliance with previous recent agreements aimed at improving work practices in the industry.

One of the major long-term gains that employers expect is a mechanism and climate to improve the attitudes of employees in the industry - to improve the industry's industrial relations culture. Greater multi-skilling and the opportunity for career paths are expected to provide workers with a more secure future and a greater commitment to the industry. Time frames of up to ten years are mentioned for changes of this nature. Participants also see award restructuring, career paths, and training as increasing the attractiveness of the industry to school leavers.

Within the workforce, interest and commitment to productivity improvement does not appear to be high among the rank and file of the unions. At this level, award restructuring is more about increasing remuneration than about improving efficiency.

In its submission, the Business Council of Australia said that:

initial indications from a survey by the BCA of progress on the Structural Efficiency Principle (SEP) suggest that progress is likely to be slow. Management and unions see the benefits from award restructuring as being long-term - with five years seen as a relatively short timeframe. Award restructuring appears not to have touched the site level at this stage,...

The Victorian Government commented that:

The challenge for the industry is to translate the commitment that exists in the peak organisations concerning award restructuring to a sceptical workforce and sceptical site management. To date progress at site level has been virtually non-existent. The establishment of modern awards negotiated at a national level will of course prove to be irrelevant unless they are properly implemented at site level.

In a submission to the draft report hearings the AFCC doubted whether award restructuring (particularly new classification structures) is being achieved. ‘A stalemate has developed.’ The federation requested that the government intervene ‘in a positive and pro-active way’.

It is difficult to see how government could be appreciably more active in award restructuring than its current involvement. Government can act to facilitate agreement, but any attempt to impose a solution without agreement or acceptance is unlikely to be successful. Successful implementation relies on negotiation between management and the workforce. Governments can set the framework but cannot determine the outcome.

A number of views were expressed to the Commission about the extent to which multi-skilling and associated changes would be adopted. One view is that multi-skilling will, in practice, be restricted essentially to the 10 to 25 per cent of the workforce employed by the main contractor. These employees would form a flexible core or task-force on a building site, complemented by the skills of subcontractors. A view held by some union officials is that multi-skilling and award restructuring will increase the productivity of the main builder’s permanent workforce and reverse the trend towards subcontracting. This may well be true in a static sense, but a permanent workforce system may not cope as well with the cyclical nature of the construction industry and its regional variability.

Union amalgamation

In the construction industry, the BWIU envisages a set of amalgamations and membership swaps to form one union that would represent all workers in the construction, forestry, mining and energy industries.

Current proposals from the ACTU are for the development of a ‘principal union’ in an industry, with other unions with a strong traditional presence remaining as ‘significant unions’. These unions would be required to agree to negotiate in a single bargaining unit with the principal union. Unions outside these categories would only be allowed to continue in an industry in exceptional circumstances.

There are a number of gains expected from the amalgamation of unions. First, the elimination of wasteful and unproductive demarcation disputes that have for so long characterised the single craft union structure in Australia. Second, a reduction in

traditional practices of narrow job demarcations within unions, and a reduction in restrictions on the flexible use of labour. Third, a reduction in negotiating time where there is only one union and one award to deal with. Finally, some union officials argue that union amalgamations will make it easier for State branches to ensure greater workplace compliance with negotiated agreements.

The potential cost for employers is that amalgamation makes the industry union very powerful - both in an industrial relations sense and politically. Because it represents all of an industry's workers, it may be able to impose conditions uniformly. There would be some constraint if the employer faces import competition, or competition from close substitutes from other industries - the union could not afford to price itself completely out of the market. The major concern is in industries which do not face international competition, as is the case for large sections of the construction industry. There is also a danger that the amalgamation of unions could result in the poor industrial relations climate from the CBD sector of the industry spreading to other sectors of construction which are currently less prone to disputes.

CRA said:

Current changes in industrial relations in the industry, including the rationalisation of awards and training proposals and reductions in the number of unions, will go some way to improving performance in the industry. However, they will not alter in any way "the balance of power" which reflects the structure and organisation of the labour market and the special characteristics of commercial activity and competition in the construction industry, especially in the Central Business District (CBD). Indeed there is some suggestion that the process of union amalgamation will increase the ability of organised labour to spread conditions and practices emanating from the CBD to other sectors of the industry.

7.4. Options for change

The Commission has considered options for change in a number of areas which influence industrial relations in the construction industry. These are discussed in the context of aims to improve efficiency and the industrial relations climate in the construction industry, together with consideration of the practical opportunities for implementation. The options considered include changes in the nature of

construction activity and the scope for more permanent employment, changes to employee representation (including the role of enterprise bargaining), and options for strengthening the position of employers. In addition, the Commission has discussed options that governments, as major clients of the construction industry, could consider if they were to adopt a more active role.

Change in the nature of the industry

Fluctuations in construction activity and the temporary nature of construction sites contribute to poor employer/employee relationships and to a bad industrial relations record in important sections of the industry. As a result, major building firms generally employ few of the workers on site, relying heavily on subcontractors. Many of the workers do not have a long-term association with, and hence commitment to, an individual project, or even to the construction industry itself.

Some participants suggested that governments should act to smooth the flow of construction work by undertaking capital works expenditure in a counter-cyclical fashion. The practicality of this suggestion is doubtful. It would not be easy for government to monitor trends in the industry so as to accurately predict future construction activity. The long and variable delays in the planning and approval processes for government projects would add to the difficulties of the approach. It also implies that government construction expenditures are discretionary, rather than in response to real needs. It would involve moving in a different direction from that currently being pursued for government enterprises, which is towards greater autonomy and greater openness to market disciplines.

Any attempt to direct government expenditure in such a way may well meet resistance from the government agencies involved. For example, the Queensland Electricity Commission commented:

It is not practical to use timing of power station construction in a counter cyclical manner. Building is done to meet predicted power demand with the latest possible capital expenditure.

The Victorian Government said that relevant data can be analysed so as to provide reasonably accurate predictions of activity. However, it commented that:

The predominant reason why this approach is not realistic in the medium term is that governments across the country are not in a position to increase their investment in capital works. State Governments in particular face serious financial constraints. Generally they are not in a position to accelerate projects simply because the building industry is experiencing a downturn. Even if governments were not constrained in this way it is not clear that such action would be an appropriate use of public funds.

While fluctuations in activity and the temporary nature of construction sites can be seen as causes of some of the industry's problems, they are essentially features to which the industry must adapt. It would be preferable to allow the construction industry to adapt to these characteristics rather than to insist that it adopt the features of more stable industries in defiance of the economic pressures on construction.

Greater permanent employment could overcome some of the industrial relations problems the industry faces. It is a strategy that is being pursued by a number of firms, including some of the larger sub-contracting firms. However, given the cyclical nature of the construction industry, the scope for permanent employment will always be considerably less than in other sectors of the economy. Moves towards a greater enterprise focus for employer/employee bargaining could assist some firms in negotiating different packages for their workforce which include greater permanency of employment. Enterprise bargaining is discussed below.

Change to employee representation

While employers acknowledged that the changes presently being implemented can improve labour productivity, many considered that inefficiencies will persist unless there are more fundamental changes. Shell commented that:

The important question is why such [restrictive work] practices are permitted to persist. While industry management must accept some responsibility, the key issue is that management has to work within an industrial and institutional framework which makes it very difficult to bring about change.

and:

Recent steps towards restructuring in national wage decisions are a step in the right direction, but in Shell's experience genuine productivity offsets have not been negotiated in the construction industry. Hence it is doubtful that meaningful progress can be made within the confines of the present system.

CRA said that Australia's present industrial relations and wage determination system is a serious institutional problem for the economy.

Recent discussions of changed industrial relations structures in Australia have canvassed the possibility of industrial bargaining at the enterprise level rather than nation-wide or industry-wide. Other options include measures to promote a more competitive labour market and the strengthening of employer representation. These matters are discussed below.

Enterprise agreements and enterprise unions

The current debate about a move towards enterprise agreements in the Australian economy has focussed on a range of possibilities. The most common involves agreements being negotiated between an enterprise and its employees, but with those employees continuing to be represented by an industry union or unions. The Business Council of Australia said that:

the development of industry based unions will not be sufficient - as exemplified in the waterfront. What is needed is the development of more decentralised arrangements that are enterprise focussed, allowing the common interest between employees and management in an enterprise to be built upon far more cooperatively than the existing confrontational industrial relations system permits.

To some degree, site agreements in the construction industry can be seen as examples of an 'enterprise agreement' negotiated by a group of industry-wide unions with employers on a site. Another option involves the formation of independent enterprise unions, or enterprise associations, to undertake negotiations on behalf of the employees.

Enterprise bargaining could allow workers in individual enterprises to negotiate different pay and conditions reflecting differences in the state of the enterprise and the particular preferences of the employees. It could also allow wages and conditions to be adapted more effectively to short-term variations in the health of individual enterprises (such as by deferring a wage increase, modifying work hours

or by payment of a bonus). The extent to which this would result in significantly different packages between enterprises would depend on the ability of the enterprise's employees to organise themselves to negotiate a package that suits their wishes. While site agreements can be seen as examples of an 'enterprise agreement' negotiated by industry-wide unions, they are generally negotiated prior to the commencement of construction. Few of the employees who will work under the site agreements conditions are involved in the negotiations.

The formation of independent enterprise unions would imply a radical change in the structure of unions in Australia. It would involve employees of an enterprise negotiating an agreement with their employer. This would result in a large number of unions and 'awards' - one for each enterprise - but because of the lack of overlap in jurisdiction, demarcation disputes would be minimal.

A problem with organising labour along essentially enterprise lines in the construction industry is that most of the people on construction projects are employed by subcontractors rather than a single employer. The temporary work-site 'enterprise', around which work is organised, usually contains a number of more permanent enterprises - the main builder and a variety of smaller contractors and subcontractors. In the construction industry, this could result in a variety of enterprise agreements with different wages and conditions operating on the same work site - a situation that is unlikely to be conducive to industrial harmony.

Despite these problems, agreements have been negotiated between the unions and some major construction companies. Concrete Constructions has negotiated a national agreement with the BWIU, covering restructuring of work organisation, training, and job security. Discussions are being held with subcontract organisations over their involvement on sites covered by the agreement. Concrete Constructions said that; 'the group's approach is already being put in place with tangible improvements in relationships with our workforce and reductions in lost time on our projects'.

A more competitive labour market

In product markets, it is generally argued that efficiency is promoted by exposing firms to competitive pressures and by placing some restraints on enterprises in a position to exercise market power. The same logic may be applicable to the labour market when considering options aimed at introducing greater competition into the supply of labour to the construction industry.

A strongly competitive labour market is most evident in the USA where the level of unionisation of the construction workforce is low - about 22 per cent_ - and where completely non-union construction sites are common, even for major projects. Within the Australian construction industry, and in construction industries in some other countries, competition with the unions is provided by the self-employed subcontracting sector. In Australia, this is strongest in the domestic housing market and weakest for major projects where the 'no-ticket, no-start' rule generally applies.

In Australia, competition from non-union labour is limited, particularly in the area of major projects. An alternative way to introduce competition would be to give a number of unions the right to represent all workers on a particular site. This would enable the employer to negotiate with a number of unions to achieve the best package of site conditions. Once agreed, the successful union would have sole representation of workers on that site for the duration of that construction project. This arrangement would also provide a greater range of employment conditions for workers as many would be happy to make a wider range of trade-offs between pay and conditions than is likely to be permitted under a more centralised system.

Such an option would, however, represent a major change in Australia's industrial relations regime and would mean moving in a different direction from the current trend which is towards the amalgamation and rationalisation of unions aimed at a greater industry, rather than craft, focus.

The implementation of a substantially more competitive labour market would be difficult, given Australia's history and established labour market practices.

Strengthening employer representation

Because of the competitive nature of the construction industry, and the considerable sums invested in individual construction projects, individual employers find it difficult to resist union demands. Employer organisations are fragmented and have found it difficult to present a united position on many industrial relations matters. The Victorian Government said that:

An impediment to improved industrial relations in the industry is the strained relations that exist between employer organisations, in particular between the Master Builders Associations (MBAs) and the AFCC. Tension between the MBAs and AFCC - often arising from personality clashes - have manifested themselves in different positions being adopted on industry matters that, prima facie, may have been expected to produce a uniform position. Such disagreements must be reconciled. It is nonsense for employer associations to exhort unions to rationalise their organisations, when the multiplicity of employer organisations frustrates orderly industrial relations.

Attempts at amalgamation of employer bodies have had little success but, even if achieved, agreement within the employer body will be difficult. Ultimately, individual firms are free to act on their own. Indeed, it could be counter-productive to strengthen employer groups as it could provide a vehicle for restrictive and anti-competitive practices in the marketplace at the expense of consumers and clients.

One way of strengthening the bargaining position of employers in the construction industry might be for government, as the principal client of the construction industry, to take a more active role in negotiating conditions and enforcing their adherence. The potential role for government is discussed below.

Strengthen regulation to limit the abuse of power

Many participants representing employers in the construction industry complained that penalties for breaches of agreements are not effective and that the current processes for enforcement of agreements are too slow. If competition does not exist to prevent the abuse of economic power, or limit the abuse of power by 'maverick' elements in the workforce, then it is reasonable to consider whether there is a role for regulation to limit the abuse of power. This could involve strengthening the hand of the AIRC and/or increasing early access to the legal system where breaches of agreements have occurred.

Events in other industries have shown that legal remedies are partially available to employers. They have also shown that there are large costs in terms of disruption during the long delays involved in the process. This has no doubt contributed to the sparing use made of legal remedies. Even if the processes were streamlined,

however, it is not clear that construction industry employers, whose vulnerability to disruption and delay is so great, would readily initiate such legal action.

The joint union submission expressed opposition to suggestions that solutions could be found by penalties and sanctions applied to employees or unions. However, at the same time, the unions indicated a need for penalties to constrain the activities of employers:

Otherwise, as workers often put it, employers will develop a contempt for their employees and carry on regardless on the basis that if they get away with it they are in front and if they are caught there can't be any penalty so why not take the risk.(P15)

Ireland commented that:

no system will satisfactorily operate without sanctions for people or organisations who breach agreements; this should include employers who pay workers to return after a strike.

The Commission believes that sanctions are a necessary feature of any system to constrain abuse of market power. However, it is not sufficient to apply sanctions and penalties on employers who breach agreements or codes of conduct. They must apply also to employees and unions. Government should set an example by resisting pressure on its own projects and by being prepared to use the available legal action when abuses occur. If the strengthening of sanctions and penalties is not possible then, at the very least, current provisions, or access to the courts, should not be reduced.

Role for government as a major client

Governments can play a significant role as major clients of the construction industry. Governments have bargaining power which could be used to encourage efficient management and labour practices. With sufficient resolve it should be feasible for Commonwealth and State Governments to introduce changes on government projects which would lead to codes of practice covering industrial relations arrangements which might be used as a model by private contractors.

A precursor to government action in this fashion would be an agreement governing the codes of behaviour which governments seek to have adopted. Once this was done, governments would be in a position to negotiate site agreements for all government projects which exclude practices that are deemed to be undesirable. In this situation, it would be crucial that governments adhere to the agreements and resist attempts to breach agreements, in particular practices such as payment for time not worked.

The Department of Industrial Relations commented that:

While the key industry parties, on the whole, are committed to change, there remains a role for Government to act as a catalytic force in achieving genuine and realistic reform.

In an address to the Victorian Branch of the AFCC in September 1990, the Minister for Industrial Relations announced the Commonwealth Government's intention to use eligibility for tendering for government construction contracts to encourage firms to adhere to a set of principles in industrial relations. This intention was restated in an address at the Presentation of a National Reform Strategy for the Building Industry on 19 December 1990. The Minister said that State governments will be asked to take part and to help draw up and operate a register of eligible contractors drawn from companies which adhere to the principles.

The Department of Industrial Relations said that:

commitment to this set of principles would have to be agreed to by companies as a prerequisite for eligibility to tender for all government contracts. To facilitate this process, a register of preferred contractors, drawn from companies which adhere to the set of principles shall be drawn up with the co-operation of State Governments.

These principles include:

- . adherence to awards and formal industrial agreements;
- . adherence to National Wage Case principles;
- . commitment to implementation of award restructuring, in practice, on site;
- . adherence to contracts that conform to a national standard which excludes provision for increases other than those permitted (on a strict rise-and-fall basis) or fixed price;

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- . commitment to comply with established standards for occupational health and safety;
 - . prohibition of 'all-in' or 'cash-in-hand' payments; and
 - . commitment to continuity of employment practices. This last means that, through effective superannuation, severance and redundancy schemes, building workers will be given the option of establishing long term career paths in the industry, rather than having to wander from job to job chasing work.

While there are many things that governments could seek to change, this inquiry has highlighted a number of areas that could be considered and warrant public discussion. These are discussed below.

Payment for time lost through disputes and inclement weather

Payment for time lost to safety disputes and inclement weather has been a contentious issue in the construction industry. Agreements to reduce time lost were part of the 1987 second tier negotiations, but their success appears to have been mixed. One reason is that pay continued to be granted for all or part of the time off. Where pay is granted as a result of dispute settling procedures, it is usually paid in full.

In the draft report, the Commission proposed that, where pay is granted as the result of a dispute over safety or inclement weather, this payment be at less than full pay. Following the draft report, the Commission received considerable comment on this issue.

Ireland states that, in Germany, workers receive 63-68 per cent of their wages on days with inclement weather and, in Sweden, only 65 per cent. Both these countries are generally regarded as having harmonious industrial relations and good safety records. In the United States, there is no pay for time not worked, but the safety record is not as good. Ireland further commented that:

In no other country which I am aware (US, UK, Denmark, Sweden, Germany, France, Italy) do people get paid 100% of wages for an inclement weather day. The reason is simple - there is no incentive to work. Most countries get 50-75%; the USA gives 0%.

Ireland suggested that Australia adopt 60 per cent payment for inclement weather after an offsetting general pay increase.

The AFCC said that in France, Germany, Sweden, the United Kingdom and United States workers are not paid at all for time lost through inclement weather, or are paid at a rate lower than when working normally.

The Commonwealth Department of Industrial Relations expressed reservations about reduced payment for time not worked saying:

In the Department's view, reduced payment for time-off as a result of inclement weather or safety disputes, whilst a desirable objective, cannot be pursued in isolation; indeed, to identify it as such may only serve to exacerbate the industrial relations problems of the industry.

The joint union submission opposed part payment for time off as a result of inclement weather or a safety dispute. The unions said:

workers would be reluctant to complain resulting in a dramatic increase in the accident rate, similar to what has happened in the USA and other countries with the consequent increase in cost as well as personal misery and suffering.(p14)

The Commission does not propose that there be no payment for time not worked where the dispute has been found to be justified. Rather it suggests that part, rather than full, payment be considered, and that the payment be a substantial proportion of the wage - for example the award wage excluding any site allowances or over award payments. A reduction of this order is unlikely to be sufficient to deter people identifying unsafe working conditions or, as a last resort, stopping work if genuine safety risks persist. It would, however, reduce the incentive to 'manufacture' safety problems or to use a strike as a first, rather than last resort.

The problem stems from the actions of a small minority of people. Union officials appear to be strongly opposed to unnecessary disruption of building sites whether by safety disputes or bomb hoaxes. However this is not sufficient. There is need for an economic incentive such as reduced pay for time not worked. This was highlighted by the Queensland Electricity Commission in relation to its experience of bomb hoaxes. The QEC said:

to the credit of the 500 men and their union delegates involved it was agreed that time off for bomb hoaxes would be time without pay on one of the QEC construction sites. This was on the grounds that bomb hoaxes were a community problem. The trade off was that union delegates would be kept fully informed. The hoaxes faded away.

The Industry Commission therefore proposes that:

- . existing agreements covering inclement weather and safety issues should be adhered to with workers being redeployed to sheltered areas in the case of inclement weather or to safe areas in the case of a hazard to safety;
- . where adequate shelter is not available to allow work to continue or when the extent of the weather problem is disputed and the dispute is decided in favour of the union, remuneration be at less than full pay. Similarly, where workers cannot be redeployed or where the extent of the safety problem is disputed, the time off as a result should be remunerated at less than full pay if the dispute is resolved in favour of the union; and
- . where time off is in breach of agreements, the time off should be without pay.

Independent expert advice may also have a useful role here. State Departments of labour already have a role, but the Commission was told in this inquiry that the State Departments are reluctant to become involved as ‘arbitrators’ of safety aspects of disputes between employees and the employer.

Better use of site agreements

The lack of enforceability appears to be a major failing of existing site agreements. This problem could be overcome by the greater use of certified agreements. The Federal Industrial Relations Act (section 115) has a provision for the Industrial Relations Commission to certify an agreement for a fixed duration. The agreement cannot be altered, except in limited circumstances. Certified agreements may include their own penalties and enforcement procedures.

In an address to the Victorian Branch of the AFCC on 21 September 1990, the Minister for Industrial Relations said that the Commonwealth Government proposes that, in the case of projects costing more than \$6 million, approved site agreements be set by way of certified agreements under Section 115, or other provisions of the Industrial Relations Act containing dispute settling procedures enforceable by the Industrial Relations Commission.

The Commission understands that site agreements are usually negotiated well before construction commences. While this might be seen to provide an element of certainty for project management, it can result in many key on-site 'players' having no input and hence, little loyalty to the agreement.

Productivity bonuses

In many industries, productivity bonuses are a common form of incentive payment. In the construction industry their use seems to be less prevalent. The Commission was told that productivity bonuses have been used successfully in some major projects outside the CBD, but that in the CBD they have generally not been successful because employees have used their industrial strength to receive agreed bonus irrespective of performance.

In general, employers were sceptical about the effectiveness of productivity bonuses, but were prepared to consider their introduction some time in the future once changes currently being introduced have improved the industrial relations climate in the industry.

The unions said that productivity agreements could reduce some corrupt practices. They said that they were agreeable to considering such schemes, providing they met certain guidelines protecting the interests of employees.

Despite scepticism about the use of productivity bonuses, the potential for improved performance, particularly through reduced lost time, is substantial and the value to employers is also very large. If past problems could be overcome, productivity bonuses could benefit all parties. Considerations that would need to be addressed are:

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- . the form the agreement would take (eg a Section 115 agreement or a legally binding contract) and with whom it would be made (the state branch of a union or the workers on the site);
 - . the form of the bonus (paid weekly, monthly, at the end-of-project or as landmark achievements are made, whether pre-specified amounts are paid or whether payments are based on a share of savings achieved);
 - . the role if any for penalties, such as reductions in accumulated bonuses for time lost;
 - . the administration of funds by a third party with strict guidelines regarding distribution; and
 - . the reversion of undistributed funds to the owners of the project.

Secret ballots

The Industrial Relations Commission has the power to order secret ballots during an industrial relations dispute, or where a dispute is threatened. In its draft report, the Industry Commission posed the question of whether there is a role for widening the use of secret ballots, or making them mandatory where strike action is contemplated. The Commission also suggested that, as industrial action should be a last resort and all other steps in the grievance procedures should be explored, consideration should be given to any vote in favour of industrial action having a limited life of, say, 24 hours before further membership affirmation is required.

The joint union submission opposed the introduction of secret ballots. The unions commented:

Secret ballots have shown to not only prolong and entrench disputes but tie the hands of the officials and make the negotiation and decision making process cumbersome and prolonged.(p17)

The unions also questioned the practicality of organising secret ballots on building sites.

The Queensland Electricity Commission commented that:

The "cooling off period" associated with setting up secret ballots when strike action is contemplated may reduce the incidence of "wildcat" strikes. The ballot is not likely to result

in a vote against taking strike action even when an independent party controls the description of the issues on the ballot paper.

Given the logistical problems, and the risk that the calling of secret ballots could be used as another means to ‘legitimately’ disrupt building sites, the Commission acknowledges that secret ballots may make only a limited contribution to reform in the construction industry.

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There is no simple answer or any single solution to the industrial relations problems in the construction industry. However, there is scope for improvements within the present system, and the changes could apply in conjunction with the current award restructuring initiatives. Aspects of the options outlined above could all be applicable in various situations.

Governments, as major clients, have considerable bargaining power. Thus, they are in a position to insist that improved practices be adopted on government construction projects. They could also provide a model for adoption by the rest of the industry.

8 AUSTRALIAN PARTICIPATION

A number of mechanisms increase Australian participation in a wide spectrum of activities, including major projects. They include State Government purchasing preferences, offset arrangements which apply to significant purchases by Commonwealth and State Government agencies and barrier protection (eg tariffs and bounties) afforded manufacturing industry. All of these increase the demand for Australian produced goods and services. Guidelines administered by the Foreign Investment Review Board relating to the operation of overseas consulting and engineering firms and to proposals for foreign investment may also affect levels of Australian participation.

In addition to these general measures, major projects are frequently subject to other requirements intended to increase levels of Australian, or even individual State content despite a recent agreement abolishing discrimination between states in sourcing policies. For example, many major projects in Western Australia are covered by special agreements ratified by the Parliament. The agreements encompass requirements that, among other matters, promote the participation of State-based suppliers and other Australian producers. In the case of the North-West Shelf project, special monitoring procedures have been instituted to scrutinise the sourcing of purchases by the joint venture. In some states, sourcing requirements even stipulate the domestic supplier from whom product should be sourced. For example, in Queensland, government policy guidelines require that only cement produced by Queensland Cement and Lime Co. Ltd, or associated companies, be used for most construction works undertaken for the Queensland Government. The guidelines apply to construction work undertaken until June 1991.

8.1 Participants' views

Some participants advocated further government initiatives to increase Australian participation in major projects. Such proposals were vigorously opposed by other participants.

Arguments in favour of increased Australian participation

Those in favour of greater Australian participation in major projects generally contended that greater involvement would promote the growth of an internationally competitive design and engineering capacity in Australia. It was claimed that this, in turn, would ensure that Australia maximised the benefits from developing its resources.

At the public hearing, AMECON stated:

We must develop a national industry policy which targets those industries where we can expect to be internationally competitive one of the major opportunities in this country to do so is through the opportunities we have in developing major projects to do with our resource developments, our infrastructure and our large capital procurement purchases by both government and the private sector.

Similar sentiments were expressed by the ACEA, saying:

we would wish to emphasise that the benefits of greater participation by Australian engineers and managers are not theoretical. There are at least two major precedents overseas, namely Canada and Norway, where Government initiative, not regulation, has boosted the domestic engineering resources to the extent that they are now major players in the international arena.

The ACEA stressed that it was seeking fair and equal opportunities for its members rather than protection or regulation. It suggested that the government:

require foreign investors to nominate how, in prefeasibility, feasibility and design they have optimised Australian involvement and how their projects, if approved, will enhance Australia's technological base.

A recent report by the House of Representative Standing Committee on Industry, Science and Technology (1989) expressed similar views:

major natural resources projects such as the North West Shelf Project which are exploiting a non-renewable national resource should contribute to the economy in more ways than simply through direct revenue, royalties and taxes. They must also contribute to developing the nation's infrastructure; to creating a wider skills base; and providing real opportunities for the expansion and development of Australian industry. Since projects of this type are also contingent on government providing approval in the form of production or export licences, government has both an opportunity and a responsibility to the Australian people to ensure that these indirect benefits, as well as the direct revenue, royalty and taxation benefits are maximised.

According to AMECON, greater Australian participation would also avoid many costs frequently associated with projects which do not fully utilise Australian capabilities. For example, it stated:

many overseas owners and developers of the major projects in Australia do not follow the most cost effective management procedures. This is either because they do not understand the Australian industrial capability and culture, and so mismanage the projects to the extent that inappropriate techniques and approaches are used leading to technical inefficiency and/or industrial relations problems, or because they have a corporate policy not to use Australian industry capabilities...

AMECON endorsed a proposal prepared by the Heavy Engineering Manufacturing Association (HEMA) aimed at increasing levels of Australian participation. The proposal seeks to introduce a co-ordinated national policy which maximises Australian industry involvement by having a set of guidelines adopted by all tiers of government. While the guidelines would not involve setting mandatory levels of Australian industry involvement, they would require that "licences, concessions or other forms of approach be granted only when the proposer demonstrates how Australian industry would be involved in a meaningful way". The guidelines would apply to most projects with a value in excess of \$30 million that require "specific engineering and planning to integrate off-the-shelf and/or specifically engineered components, systems or services to provide a product for operational use."

The opportunity for local firms to participate in major projects was also discussed in a recent report of the Australian Manufacturing Council (Optimising Australian Industry Involvement in Major Projects, May 1990). The Council said:

On the demand side, respondents identified problems in obtaining a full, fair and equal opportunity to compete in some major projects. One reason stated by many survey respondents was the tendency of overseas project owners and managers to favour overseas products and engineering services with which they were already familiar...Other demand side problems included a poor perception and a lack of understanding of local industry and conditions, insufficient time for local industry to tender, and other concerns regarding tender documents, codes and procedures.

On the supply side, the study showed that a number of survey respondents considered that sections of local industry had poor marketing, insufficient quality control, poor delivery performance, and experienced difficulties in adhering to complex tendering processes and documents.

Participants' arguments against increased Australian participation.

Major projects are subject to significant pressures from governments and from unions to increase levels of Australian participation. A number of participants argued against any government intervention which would force companies to increase levels of Australian participation.

In the main, participants opposing initiatives to increased local participation claimed that any intervention would increase costs and reduce competitiveness. Costs would increase not only because of higher prices paid for locally sourced goods and services, but also because local delivery times and quality often cannot match those available from overseas, and because increased participation could entail dealing with firms inexperienced in major projects. Esso commented:

Any kind of explicit or implicit enforcement of Australian content is anathema to the development of an internationally competitive construction industry. It follows that government should have no role in encouraging greater local participation.

CRA likened approaches to increase Australian participation to traditional forms of industry protection. It saw such initiatives as leading to an increase in costs and a decrease in its international competitiveness. CRA also expressed concern that increasing Australian content is being introduced not so much through the implementation of government decisions, but "by subtle coercion and bureaucratic intervention".

Esso provided one example - a major fabrication contract for the Goodwyn 'A' platform on the North West Shelf - where it was eventually decided to source the work locally, even though local tenders were less favourable than those received from foreign contractors. The company indicated that the joint venturer's decision to accept the Australian tender was based on fears of union disruption.

The Queensland Electricity Commission referred to problems which stem from lobbying for Australian participation:

Post-contract pressures (sometimes by unsuccessful tenderers) on the Australian Government or its departments and lobbying of state politicians have resulted in considerable disruption and additional expense to the QEC. ...Hence the most productive measures the government could take would be to ensure its requirements are firm, clear and not subject to change for the duration of a project. The "subtle coercion and bureaucratic intervention" in response to lobbying is very disruptive and sometimes embarrassing because of poor performance on the part of Australian suppliers.

8.2 Current levels of Australian participation in major projects.

There is little aggregate data on levels of local participation in major projects, but there is some data about individual projects.

- Around 65 per cent local content was achieved on the North Rankin platform 'A' development of the North Coast Shelf project. Sixteen of the 20 major contract packages (those over \$10 million) awarded for the North Rankin platform were sourced in Australia. Of those, 13 were sourced in Western Australia.
- Of the \$1.6 billion expended on the domestic gas phase of the North West Shelf project (including the construction of the North Rankin platform), 72 per cent was sourced in Australia. This encompassed 62 per cent of the value of consulting services, 43 per cent of purchase orders and 80 per cent of the value of contracts let.
- Of the \$7.7 billion which Woodside estimates will have been spent on the North West Shelf project by 1993, \$5.4 billion (about 70 per cent) will have been spent in Australia.
- The Maddock Report (1989) suggested that Australian suppliers accounted for 70 per cent or greater of material purchased in the projects examined.
- Australian content in the Loy Yang 'A' power station in Victoria is around 70 per cent.
- According to CRA, the Hamersely Project had an Australian content of over 80 per cent.

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- The Australian content of the Anzac Frigate Program is expected to be about 80 per cent.
 - A recent study by the Construction Industry Council found that Australian construction firms provided almost 80 per cent of the value of all service inputs for major projects. It found that Australian companies secured a 91 per cent share of design services, a 37 per cent share of turnkey design and construction services, and a 81 per cent share of construction services.
 - A 1990 report by the Australian Manufacturing Council presented case study data and reported the findings of a study by the Basic Mineral Industry Council. In the 13 projects examined, the Australian content ranged from 70 to 95 per cent.

The figures cited above suggest high levels of local content, although it must be recognised that, in most instances, the data include a proportion of civil engineering work and infrastructure development which must be carried out in Australia. Consequently, the Australian content in other activities (eg materials and equipment supply) may be less than the proportion for the project as a whole.

For most projects, a high level of local content is only to be expected because most developers perceive advantages in dealing with Australian suppliers. Factors said to favour local suppliers include: better communications; better access to back-up services, supply of spare parts, repairs and maintenance; and, in some cases, lower transport costs. Tariffs on imported goods, government purchasing requirements and pressures exerted by governments and other groups in the community were also said to increase local participation.

Factors said to disadvantage local suppliers include: limited or no capacity in Australia to undertake some specialised tasks (eg certain castings cannot be manufactured locally); the limited experience of Australian companies in meeting the quality assurance standards required for some major projects; the practice of specifying some contracts in terms of overseas rather than Australian standards; and poor delivery performance.

In relation to delivery performance, CWAI submitted that the proportion of equipment for the North West Shelf project supplied on time by Australian suppliers was only half that achieved by overseas suppliers (16 and 30 per cent

respectively). Overall, 75 per cent of overseas supplied equipment was delivered within 3 months of the contracted date, compared to 52 per cent for domestically sourced equipment.

8.3 The Commission's view.

The rationale underlying demands for government support to increase Australian participation appears to have two major strands. First, government intervention to direct additional activity to Australian suppliers will permit the industry to develop to the stage where it will be internationally competitive. Second, the development of Australian engineering capacity will result in 'spillover' benefits, mainly in the form of technology transfers, which will act as a catalyst for economic growth in related industries. An additional view is that foreign project developers have overlooked the advantages of greater local sourcing and that the mandated use of Australian engineers and equipment would reduce the cost of project development.

There is a strong possibility that few, if any, of these benefits would materialise. Government support for the Australian motor vehicle industry at much higher levels than that envisaged by participants to this inquiry has not enabled that industry to achieve international competitiveness. Similarly, spillover benefits to the industry supplying motor vehicle components and other related industries have not fulfilled expectations. Experience in other industries suggests that exposing industries to competition provides greater incentive for adopting new technologies and to increase efficiency than does introducing measures that shelter industries from international competition.

As far as reducing project cost is concerned, implicit in such statements is the suggestion that overseas developers are either incompetent or not aware of the cost saving benefits of using more Australian input, or that they deliberately 'boycott' lower cost Australian suppliers. Neither scenario is particularly plausible. Firms are likely to make rational judgements about costs, quality and risks of alternative sourcing. There is no evidence to indicate that these are not essentially economic decisions.

One of the proposals for increasing local engineering participation involves ‘encouraging’ joint ventures between local and overseas engineering firms. However, this approach is unlikely to be costless. Overseas firms have often invested considerable resources in developing their technology, skills and expertise, and this knowledge or expertise is their livelihood. To expect them to transfer this to rival Australian firms at no cost is unrealistic. If joint ventures were ‘encouraged’, local engineers would certainly benefit, but rather than buying the knowledge or expertise, or taking the risk of developing it themselves, it would be paid for by the wider community through the diversion of resource rents, or by the developer in higher costs. It is not, as is implied, a costless device to enrich Australia at the expense of foreigners.

Some participants argue that all they are asking for is ‘free and fair access’. This may sound superficially quite reasonable. However, it is in the implementation or administration of such proposals that the problems arise. For example, the ACEA’s proposal requires firms to ‘prove’ to government that free and fair access has been given. Besides the cost in time and money involved, it is difficult to see how this could be proved.

A danger with such proposals is the need for bureaucratic oversight and the need for reporting of tendering processes. In addition to the cost in money and time of complying with such oversight, it establishes a vehicle for ‘persuading’ projects to have a higher level of local content than the costs would normally lead to.

An obligation to increase local servicing would deprive project managers of the opportunity to use cheaper overseas options. In addition, the perception that governments may encourage, or enforce, increased local participation in major projects may discourage overseas suppliers from submitting tenders. This could appreciably add to Australian costs by denying local project owners the opportunity of sourcing from some lower cost overseas suppliers. Apart from price differences, it could also necessitate the use of local firms that, because they lack the necessary experience, expertise or access to ‘state of the art’ technology, cannot complete the job to the standard expected of an overseas contractor.

Requirements to increase local content can increase project costs and reduce their international competitiveness. Alternatively, they can cause the abandonment of new projects. Under either scenario, the curtailment in activity related to major

projects can adversely affect the development of Australian engineering industries - the sector of the economy which it is presumed would be the major beneficiary of government activities to increase levels of Australian participation.

There is little public data available about the cost penalties associated with increasing local content in major projects. However, the Commission has indicative information about recent contracts for engineering fabrications for the \$1.6 billion Goodwyn A platform where the operators were placed under considerable pressure to assign certain contracts to Australian industry. This suggests that the lowest cost tenders for the utilities modules and piles for the platform were about 50 per cent higher than overseas tenders. There may have been additional cost penalties in having to split the contracts to enable orders to be awarded locally. For example, cost savings may have resulted if the process and utilities modules contracts were combined.

Despite these cost penalties, further negotiations resulted in the contracts being let to Australian tenderers. The cost penalties were partly offset by the Australian Government confirming that particular items could be imported duty free, some concessions made by the Western Australian and South Australian Governments and the tenderers, and certain undertakings by the unions. When awarding the contracts Woodside commented that, even with these concessions, the Australian contracts were still more expensive.

In the Commission's view, economic efficiency is not enhanced by government measures to artificially increase Australian participation. Although not uniform across activities, Australian participation in major projects is already high. Measures to increase participation jeopardise international competitiveness and, in turn, retard the development of Australian engineering industries. It would also be advantageous if greater recognition of this linkage were to reduce 'informal' pressures exerted on principals of major projects to increase Australian participation.

These views apply not only to initiatives that seek to increase total Australian content, but also to policies intended to direct work to contractors based in the State, or even the local government area, where major projects are located. These policies not only deny major projects access to lower cost international suppliers, but also to low cost suppliers elsewhere in Australia.

This is not to say that the community should not get some return from major resource projects. As owners of Australia's natural resources, the community should expect some benefits. However, this return should be obtained in a way which does not impair efficiency, such as through neutral tax/royalty arrangements. The community as a whole, and not just engineering industries, should receive the maximum benefit consistent with this objective.

In September 1990 the Commonwealth Government responded to the report of the House of Representatives Standing Committee on Industry, Science and Technology.¹ It stated that it does not expect project developers to pay premium prices for local goods and services and that it will not mandate levels of local industry involvement in resource projects. The Government also stated that it:

expects project managers to recognise, when calling tenders, that local firms may require more time to put in place arrangements to acquire the necessary expertise and mobilise the necessary skills. Such tenders should be based upon internationally recognised specifications and standards.

¹ Joint Statement by the Minister for Industry, Technology and Commerce and the Minister for Resources, 'Government Encourages Australian Industry Cooperation in Offshore Oil Gas Developments', 13 September 1990.

9 OTHER FACTORS

Participants identified several other factors which they claim impose additional costs on the construction industry and reduce competitiveness. These include:

- infrastructure costs;
- tariffs and the tariff concessions;
- taxation;
- transport costs;
- interest costs; and,
- workers' compensation arrangements.

Each of these issues is dealt with briefly below.

9.1 Infrastructure costs

The Confederation of Western Australian Industry and BHP Engineering, among others, argued that infrastructure requirements attached to project approval by government raise costs unnecessarily. They identified three major difficulties.

Unrealistic requirements are placed on projects in terms of both the quantity and quality of the infrastructure required.

Infrastructure costs are charged to the project where, under other circumstances, government would normally meet the costs. For example, infrastructure requirements, especially for remote projects, are often tied to other government objectives, such as decentralisation. Thus, the costs of developing integrated townships which would exist irrespective of a major project, are sometimes inequitably charged to the project.

Uncertainty related to project infrastructure requirements raises costs.

Provision of infrastructure can account for a large part of the capital expenditure of a project. BHP Engineering estimated that private and social infrastructure accounted for between 25 and 50 per cent of capital costs for a range of projects. Bradley (1986) estimated that infrastructure expenditure in mineral projects in Western Australia accounted for 17 per cent of total capital expenditure, of which social infrastructure accounted for around 6 percentage points.

The Commission does not suggest that projects should not be responsible for providing infrastructure; the central issue concerns the respective liability of government and proprietors. Private infrastructure includes items such as roads and drainage within the construction site. There is little argument that the responsibility for this lies with the project. There is, however, scope for argument about providing public infrastructure, such as schools, medical services and roads, especially where major projects are used as a vehicle for government development policy. The Confederation of Western Australian Industry and other participants argued that resource development, often in remote areas, had been used in this way.

What is the role of government in providing social infrastructure?

Government generally undertakes to provide a range of services to the community funded from general revenue. Making a project entirely responsible for the costs incurred in providing such services imposes a direct cost on major projects to the advantage of the public purse. On the other hand, the costs of providing services to large projects, especially in remote areas, can be higher than for other localities. In these circumstances, there is a case for the additional costs of provision over the 'norm' being met by the project. However, in practice there may be no clear way of determining the level of services that government should provide, nor of accurately ascertaining the incremental costs attributable to the project. Further, there are additional complexities related to each project, such as the benefits of infrastructure to the wider community. These considerations suggest that liability will have to be assessed on a case by case basis.

Insistence by government on infrastructure over and above that which the project needs can have four effects. First, requirements to 'over-engineer' or 'goldplate' infrastructure quality represents an inefficient use of resources. Second, where the increase in costs cannot be passed on or be absorbed in economic rent, it increases the costs of the project and reduces competitiveness. Third, it can dissipate potential royalty payments flowing back to the community where the price of access

to minerals or other inputs is negotiated with government. The magnitude of the dissipated rents can be gauged from the additional payment of \$50 million levied on the Argyle diamond project when the owners elected to operate a ‘fly in, fly out’ operation rather than establish a town. The lack of transparency inherent in such arrangements reduces accountability within government and reduces the effectiveness of expenditure controls in meeting policy objectives. Any increase in the quality of the infrastructure required by government above accepted engineering and safety standards should be at the expense of government. Fourth, requiring investment in social infrastructure as part of a project can lead to an expensive ghost town and sunk investment after the project has finished its productive life.

9.2 Tariffs and tariff concessions

Participants argued that the tariff system increases the costs of equipment in major projects. BHP Engineering estimated the addition to equipment costs at 10 to 20 per cent. Additional problems identified included the uncertainty associated with the tariff classification of some goods and the operation of commercial tariff concessions. For example, participants argued that the rate of duty on imported equipment cannot always be calculated before importing as there is a degree of discretion in the rates that apply. The Australian Customs Service, however, said that there was no provision for discretion in the classification of imports. Notwithstanding this, disputes over classification do arise and this generates uncertainty when importing items that are not easily classified.

The operation of the Commercial Tariff Concession System was said to raise the costs of equipment as domestic manufacturers could claim the ability to produce, while never having produced comparable equipment. Participants claimed there was no onus to prove the practicality of such claims and that the system increased the cost of importing, rather than diverting work to local producers, as often the technology could only be sourced overseas.

Tariffs raise the costs of production for all Australian industries. The uncertainty about the rate to be applied to imports is an undesirable element of the present complex system of classifications and rates. However, the significance of such effects is diminishing with implementation of the Government's policy to place a ceiling of 15 per cent on tariffs on most goods by 1992. This will reduce the disparities in the average tariff on inputs paid by all Australian industries.

The Commission is examining the Commercial Tariff Concession System in a separate inquiry. The report is to be forwarded to the Government by 21 March 1991. Issues raised by participants in this inquiry will be considered during the inquiry into the Commercial Tariff Concession System.

9.3 Taxation

Several participants said that construction activity is disadvantaged by some taxation provisions and associated taxation rulings. Some sought the extension of tax concessions - particularly those granted to the mining industry - to other activities. Many of the matters raised by participants, however, identified more general problems with the current taxation system.

Tax concessions

CRA commented that housing and welfare facilities constructed at a mine site for use by employees of the mining company in processing the ore mined by that company are tax deductible, but if a separate legal entity is formed to undertake the processing at the mine site, the housing and welfare facilities are not tax deductible.

Certain capital expenditure for prescribed mining operations are deductible by instalments over the the mine life or ten years, whichever is the lesser. This permits faster write off than is generally available to other industries where depreciation provisions, based on the economic life to the capital item, may be up to 40 years.

If the depreciation available to mining for such capital expenditure is a true reflection of the depreciation of the value of those assets, then it would seem appropriate that similar depreciation provisions be available to other industries that build or purchase such capital items. However, while the life of the mine may be an

appropriate life for capital assets in mining, the 10 year option provides the opportunity for write off at concessional rates when the mine life is greater. In general, the Commission considers it undesirable to use the tax system to provide assistance to industry. It introduces conflicting objectives into the tax system, provides grounds for anomalies and disputes, and reduces the transparency of assistance provided to industry. If the treatment allowed for mining is concessional, as appears to be the case, then a more equitable treatment of taxpayers would lead to the consideration of the removal of the mining concession rather than its extension to other activities. Industry assistance, if warranted, would be best provided in a more direct manner.

General issues

Sales and excise taxes on inputs

The ECNSW, the Western Australian Department of Resource Development and the MTIA raised the question of sales tax and excises paid on inputs into construction when exemptions are available for other activities - principally manufacturing and government bodies.

Exemptions for inputs to manufacturing are provided essentially because most of the output of manufacturing is subject to sales tax. As the output of the services sector, including construction, is generally not subject to sales tax, exemptions are not provided for their inputs. Nonetheless, Australia's current wholesale sales tax system is acknowledged to be far from ideal. There has been much debate about the scope for modification, or its replacement with some form of value added tax on goods and services. The elimination of taxes on inputs into the production of goods and services, including exports, could be achieved by the replacement of the sales and excise tax system by an appropriately structured value added tax, or through a substantial modification of the existing system. In the 1990 Budget speech, the Treasurer announced a review of the wholesale sales tax system. This will provide a forum for considering the problems faced by industry.

The effects of inflation

The Australian Finance Conference raised the question of the 'devaluation' of tax losses as a result of inflation when such losses had to be carried for a number of years before a profit was made. To allow immediate write off, the Conference requested greater freedom to transfer the losses to other companies. The Australian Finance Conference said:

restrictions on the use of tax benefit transfer provide a competitive advantage to certain taxpayers, ie those that have sufficient assessable income in the relevant period to recoup the allowable deductions.

and;

The delay in receiving credit imposes costs though the decline in the real value of the claim due to inflation, and the loss of the opportunity to use the funds.

Fundamental problems are presented by the impact of inflation on the tax system which was designed essentially when inflation was not a major problem in Australia. Inflation affects many aspects of the tax system and its adverse effects need to be considered more broadly than the particular problems raised in this inquiry. This would involve reductions in inflation in Australia, which is an objective of government, or adjusting (indexing) the taxation system for the effects of inflation. Indexing using something like the government bond rate, rather than just the rate of inflation, would also overcome the problem of 'devalued' benefits as a result of the loss of the opportunity to use the funds.

Treatment of certain expenditures on asset creation

CRA requested that the cost of feasibility studies be deductible in the year incurred. This raises a fundamental question about the tax deductibility of expenditures that are incurred in the creation of an asset. As feasibility studies appear to be such a cost, their value would be included in the final value of the asset created and would presumably be included as a component of the depreciation allowance for that asset. Alternatively, if the asset were sold, the cost of feasibility studies, along with other costs in acquiring the asset, could be written off against the sales value. As in practice this appears to be the case, there does not seem to be any pressing reason for any change to allow immediate deductibility.

A problem may, however, arise when the feasibility study does not result in the purchase or creation of an asset, that is, when a decision is made not to proceed with the project. A similar problem was raised by DITAC which highlighted demolition and site clearance costs which were not linked to either the plant being demolished or as a cost against the new plant.

Where a project does not go ahead, then it can be argued that a capital loss has been made, and it would appear reasonable that such a loss should be eligible for write-off against other capital gains. This does not appear to be the case at present.

A similar problem in relation to expenditures on environmental assessment was raised by the BIE (1990). The BIE concluded that the taxation treatment appears to be inconsistent with present public policy, and that expenditure on environmental assessment should be deductible, at least against income from the activity to which the assessment relates.

However, expenditure on environmental assessment would appear to be similar to expenditure on feasibility studies (that is, be expenditure for the creation of an asset). If this is the case, the cost should be included in the cost of the asset for depreciation purposes, rather than for immediate deduction against income. Review of the treatment of environmental assessment costs for projects which do not go ahead is necessary, on a similar basis to that of feasibility expenditures on projects which do not proceed.

The capital gains tax, however, is a relatively new tax in Australia and inevitably there will be situations where all contingencies have not been taken into account. The treatment of capital gains is being modified as the result of problems and anomalies raised by taxpayers. In this context, the treatment of feasibility costs and site clearing costs warrants review.

Taxation of government owned enterprises

The ECNSW raised the problem of the inability to claim tax losses when construction is by tax-exempt government authorities, and potential income tax problems where construction is on a build-own-operate basis. The ECNSW also raised the question of sales tax being applied to equipment and materials bought by build-own-operate contractors carrying out work which would be otherwise carried out by sales tax exempt public bodies.

If there are anomalies arising from the tax exempt status of public enterprises, a solution to those anomalies could be found in removing the tax exempt status rather than attempting to protect the benefits of tax exemption. This would help provide a more neutral environment within which government business enterprises and private sector organisations operate.

Remote locations

The Western Australian Department of Resource Development regarded higher fringe benefits tax payments, higher PAYE payments and higher fuel excise payments for remote location projects as inequitable. Because remote projects pay higher wages, provide more fringe benefits and use more fuel, they pay more tax than projects in less remote locations. The Department requested that the Commonwealth Zone rebates be revised and upgraded. The Department said that the real level of the Zone rebates had been severely eroded due to the effects of inflation due to the lack of regular adjustments to the rebate since 1984.

There is some merit in the argument that taxation of remote area wages at standard rates can distort the allocation of resources between remote areas and the rest of Australia. Significantly higher wages must normally be paid to attract labour to remote sites. This remote area wage premium represents an "equalising difference" which compensates workers for harsh conditions and lack of normal amenities. Of itself, the remote area wage differential promotes efficient location decisions by drawing firms' attention to the real costs of remote area activity. However, in the absence of adequate zone allowances, some or all of the wage differential will be subject to tax, with the result that pre-tax wages in remote areas will need to rise to preserve the post-tax value of the differential to the worker. This tax-induced magnification of the remote area wage differential will, in turn, penalise industry in remote areas and inefficiently restrict remote area development. The Commission is not in a position to say what the efficient level of zone allowances should be, but once appropriate allowances have been established, it would be undesirable to see their real value inadvertently eroded by inflation.

The Commission does not consider that remote location tax relief should be provided by lower taxes on particular components of income such as fringe benefits as this would distort the decision on whether to pay workers in the form of money or benefits. Any relief should be provided directly, irrespective of the way income is provided to the taxpayer.

Conclusion

Most of the issues identified are relevant to other industries as well as construction. Some of the problems raised by participants are likely to be resolved by a review of the wholesale sales tax system announced by the Treasurer in the 1990 Budget speech and a review into simplifying the taxation system being undertaken by the Commonwealth Treasury and the Australian Taxation Office. Other matters raised concern the interpretation of the tax legislation and are best pursued by participants with the ATO. However, some problems raised covering the effects of inflation and the treatment of certain capital expenses warrant review by government.

9.4 Transport and modular construction costs

The inadequacy and high cost of sea and land transport was said to raise the costs of construction and reduce off-site modular construction. Participants contended that, while the domestic price of plant and equipment can be competitive with overseas, its delivered cost at the project site can often exceed the price of an imported alternative. The requirement to use Australian crews on coastal routes, restrictions on the weights and dimensions allowed on road and rail routes, and differing State regulation of loads were said to underlie many of the transport problems.

The transport of domestically-produced components from manufacturing centres on the eastern coast of Australia to remote sites in central and western Australia was identified to be of particular concern. Thitchener and Kjar (1986) argued that preassembly of factories, plant and equipment reduced capital costs by 5-10 per cent

where used overseas. The advantages were said to include ease of access to established manufacturing centres, greater quality control and reduced on-site disputes.

Over recent years, governments have attempted to improve the efficiency of transport in Australia. For example, the Commonwealth Government has initiated reforms on the waterfront and coastal shipping, largely intended to improve work practices. Some State governments have recently announced their intention to develop heavy lift corridors linking major production centres with ports and industrial areas.

Recent reports into road pricing by the Inter-State Commission and rail efficiency by the Railway Industry Council and the National Freight Group are being considered by government. Issues relating to rail transport are under reference to the Commission in the Rail Transport Inquiry.

Clearly there are inefficiencies in the domestic transport system that raise the costs of construction for major projects, as they do for many other industries. Reforms in these areas are important in their own right. Their effect in reducing costs of construction will be indirect, but nevertheless substantial.

9.5 Interest costs

Some participants argued that the Government's macroeconomic policies have led to the high domestic interest rates and increased the capital costs of major projects.

Domestic real interest rates have been at historically high levels, as has the differential between domestic and overseas rates. The impact of high domestic rates is not uniform across the economy, affecting some major construction projects more than others. However, in some respects, major projects may be less affected by interest costs than other areas of the economy. This would apply to those projects entailing the production of traded goods. Export oriented projects can borrow overseas at lower interest rates with little exchange rate risk by borrowing in the same currencies as expected export revenues. Projects producing import competing goods may also face low exchange rate risk as movements in exchange rates are offset by increases in domestic prices of import competing goods following a

devaluation. While overseas finance at lower interest rates could be used for residential and CBD construction which are essentially non-traded, the same facility to eliminate exchange rate risk is not present.

High real interest rates have been part of the Commonwealth Government's macroeconomic policy and will have different effects across the economy. However, as a major aim of the policy has been to reduce domestic activity, relief from its effects would be inconsistent with this objective.

9.6 Workers' compensation arrangements

In the 1980s, the adoption by government of a community rating system for workers' compensation in a number of States gave rise to cross subsidies from relatively low risk to higher risk industries, such as the construction industry. Recent changes have moved the arrangements closer to a user pays system. Any cross-subsidisation of workers' compensation in construction that now exists is largely because of difficulties in assessing risk and are inherent in any insurance scheme.

Workers' compensation arrangements for the construction industry are dealt with in more detail in Appendix D.

10 IMPLICATIONS OF MICROECONOMIC REFORM FOR THE CONSTRUCTION INDUSTRY

The Industries Assistance Commission, in its 1988-1989 Annual report, examined the impact on the economy of a wide range of microeconomic reforms. A major element in this package was the curtailment of government assistance to manufacturing and agriculture. This initiative would eliminate tariff protection and certain forms of rural assistance, such as price support schemes for dairy products. The other initiatives which were considered would remove inefficiencies in the transport, communications and energy sectors. For the construction sector, the reforms, as a whole, are projected to have significant effects, in the form of expanded activity and lower costs.

Although not addressed in the Annual Report, there are also inefficiencies in the construction sector which warrant reform. In particular, there is scope for gains from labour market reform and from streamlining the regulatory approval process. To illustrate the potential effects of these reforms, some additional simulations are discussed below.

10.1 Reforms to construction

The analysis in this Chapter is based on the ORANI model of the Australian Economy.¹ The construction sector is divided into two industries: *Residential building and Other construction*. Because residential projects do not generally qualify as 'major', the activities which are covered by this inquiry relate mostly to *Other Construction*.

¹ The model is described briefly in IC (1987) and more fully in Dixon et al (1982). The version of ORANI which is used is FH-ORANI. A technical specification of this version is given in Dee (1989).

Two productivity improvements to Other Construction were modelled: a 1 per cent gain in labour productivity because of labour market reform; and a 0.5 per cent increase in total factor productivity which results from rationalising the regulatory approval process. The magnitudes of the assumed gains are not intended to represent what could be achieved in practice. Rather, the simulations serve only to demonstrate that even modest gains in Other Construction productivity can have significant effects, both on the industry and on the economy generally.

Table 10.1: Estimated impacts of productivity improvements in the "Other Construction" industry (long term)

<i>Improvement</i>	<i>Other construction industry</i>			<i>Aggregate -employ- ment</i>	<i>Real GDP</i>
	<i>output</i>	<i>average cost</i>	<i>employ ment</i>		
	<i>(per cent change)</i>				
1% Labour Productivity Improvement in Other Construction	.24	-.44	-.70	-.01	10
0.5% Total Factor Productivity Improvement in Other Construction	.27	-.53	-.24	-.01	.12
Total a	.50	-.96	.94	-.02	22

a Because of rounding columns may not add to total.
Source: Industry Commission estimates

The analysis concerns the long-run effects which eventuate after adjustments to the productivity changes are substantially complete (say, after 5 years). As estimated, the gain in labour productivity has similar long-run effects to the gain in total factor productivity (Table 10.1). Together, they are estimated to reduce production costs in *Other Construction* by 1.0 per cent and to raise output in this industry by 0.5 per cent. Because of the lowered cost of non-residential construction, other industries would also expand, and real GDP increases by an estimated 0.2 per cent. In 1988-89, an increase in real GDP of this size would amount to \$670 million.

Employment in *Other Construction* would decline, since the gains in productivity are labour-saving. However, employment in other industries would increase in line with output. As a result, aggregate employment would remain virtually unchanged.

10.2 Reforms examined in the 1988-1989 Annual Report

The analysis in the Annual Report concerned specific reforms to transport, communication, energy and industry assistance.² The long-run effects on the construction industry of these reforms were estimated via ORANI and collectively they were estimated to reduce construction costs by around 2 per cent. The reform which contributes most to this effect is the removal of tariff protection for manufacturing. By lowering the cost of imported inputs to construction, this reform would have a direct effect in lowering construction costs. This would be reinforced by the indirect effects, stemming from cost declines in other industries. Since cost changes in ORANI are passed on to purchasers, this implies lower costs to the construction industry for domestically produced inputs.

For the economy as a whole, the reform package is projected to be beneficial, as indicated by a 4.7 per cent gain in aggregate production (real GDP). Production in the construction industry is projected to increase by 6.6 per cent. The above-average performance of construction can be explained by several other projected outcomes of reform.

First, the economy would become wealthier, as reflected by the increase in real GDP. This would lead to a relatively large increase in the consumption of luxury goods. If, as assumed in ORANI, housing is a luxury good, the performance of residential construction would be above-average.

² The key assumption which underpin the long-run nature of the projections are explained in the Annual Report (IAC 1989). A less critical assumption is that government consumption spending moves in line with household consumption spending.

Secondly, there would be a large increase in mining activity, which relies heavily on constructed plant.

Thirdly, the cost of capital would decline relative to labour, thereby increasing the demand for capital. This would favour the capital-producing industries such as non-residential construction.

APPENDIX A: PARTICIPANTS WHO MADE WRITTEN SUBMISSIONS

The organisations listed below provided the Commission with one or more written submissions:

Altona Petrochemical Company
AMC Mineral Sands Ltd
AMECON - Dr J White
Association of Consulting Engineers Australia, The
Australia Federation of Construction Contractors
Australia Pacific Project Corporation
Australian Institute of Project Management, The
Australian Institute of Quantity Surveyors, The
Australian Petroleum Exploration Association Limited
Australian Finance Conference
BHP Engineering
Building Owners & Managers Association (BOMA)
Building Workers' Industrial Union of Australia
Business Council of Australia
Chemical Confederation of Australia
Concrete Constructions Group
Confederation of WA Industry, The
CRA Limited
Department of Industrial Relations
Department of Industry, Technology & Commerce
Department of Resources Development (WA)
Electrical Contractors Association of NSW
Electricity Commission of NSW
Electricity Supply Association of Australia
ESSO Australia Ltd
Heavy Engineering Manufacturers' Association
Hydro-Electric Commission, Tasmania
Institution of Engineers, Australia, The
LURGI (Australia)
Master Builders - Construction & Housing Association of Australia
MTIA - National Construction Council

Pappas Carter Evans & Koop
Quality Project Chambers
Queensland Electricity Commission
Rhône-Poulenc Australia Holdings Pty Ltd
Shell Company of Australia, The
T W Crow Associates
Vernon Ireland, Professor
Victorian Government, The
Victorian Metals and Engineering Industry Development Committee
Westask Project Development Engineers Pty Ltd

APPENDIX B: PRODUCTIVITY OF THE CONSTRUCTION INDUSTRY

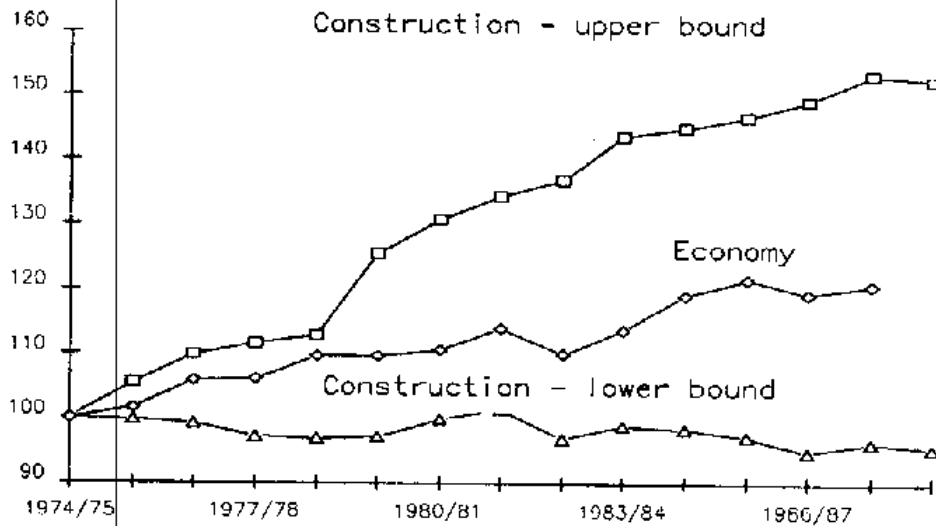
This appendix presents measures of multi-factor productivity and the average product of labour for the aggregate construction industry based on data published by the Australian Bureau of Statistics (ABS) in the Australian National Accounts. The data covers all construction, including major projects.

Difficulties in measuring real output complicate studies of service sector productivity. This is because of the difficulty of measuring a standard unit of a service, such as a building. Standard measures of output price movements in services tend to be based on movements of input costs. This can imply there is no technical progress in the industry. The other extreme is to assume that the nominal price of output is representative of increases in real output. In this Appendix, both assumptions are used to provide a range of estimates of multi-factor productivity.

Multi-factor productivity is measured as the difference between the natural logarithm of output and the weighted sum of the natural logarithms of inputs (usually capital and labour). The two estimates of multi-factor productivity for the construction industry are presented in Figure B.1 and compared with the ABS estimate for the economy. The lower bound of the estimates indicates an annual trend decline of 0.4 per cent in the efficiency of construction between 1970-71 and 1988-89, while the upper bound estimates a productivity increase of 3.7 per cent per annum. The estimates of productivity growth for the economy are within the bounds of productivity growth of the construction industry, with an average annual rate of 1.3 per cent.

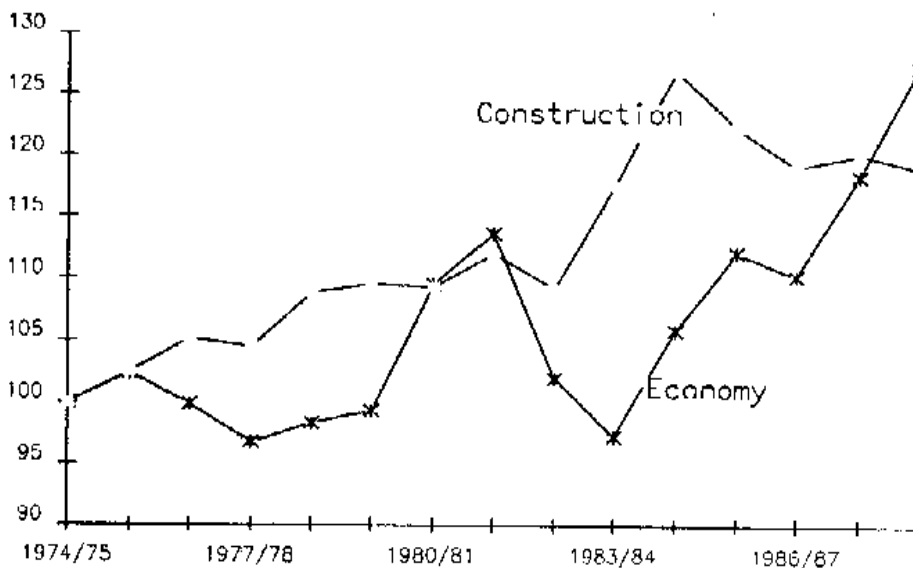
The lower bound estimates of multi-factor productivity derived from ABS data are broadly consistent with OECD (1990) which presented data for Australia showing that multi-factor productivity growth for the construction industry was negative at -0.1 per cent per annum from 1972 to 1979, and then grew by 1.2 per cent per annum from 1979 to 1985. The corresponding averages of OECD countries for the construction industry based on the same measure of output as the ABS lower bound estimate were -0.3 and 0.0 per cent, suggesting that productivity growth in Australia followed a broadly similar pattern to other developed countries.

Figure B.1: Upper and Lower Estimates of Multi-factor Productivity in Construction and the Economy
1974-75 = 100



Source: Commission estimates and ABS (1990a)

Figure B.2: Average Product of Labour in Construction and the Economy
1964-75 = 100



Source: Commission estimates and ABS (1990a)

The average product of labour for the construction industry and the ABS series for the economy are presented in Figure B.2. The average product of labour in construction grew on average by 1.9 per cent per annum over the period, while the average product of labour for the economy as a whole grew at 1.4 per cent per annum. OECD (1990) estimated the annual growth of the average product of labour in construction in Australia to be 1.6 per cent for 1973 to 1979, and 2.4 per cent for 1979 to 1985. The corresponding averages for OECD countries were 0.8 per cent for both periods. The level of the average product of labour for Australia is 7 per cent higher than the OECD average. However, there is insufficient information to determine whether the difference is significant.

Changes in labour productivity reflect the relative growth rates of labour and output and can indicate increased efficiency in the industry. However, the results must be interpreted with caution as, in some circumstances, increases in labour productivity could be at the expense of deteriorating productivity of another input. A feature of the industry has been an increase in capital intensity arising from a rapid increase in capital stock and a trend decline in employment over the last decade.

Some participants drew attention to the Maddock Report (1989) as an indicator of the industry's performance. That report found that 43 per cent of projects had a cost overrun, 34 per cent had a time overrun and 24 per cent experienced both. The Dipstick Survey (1989) obtained similar results. However, these data relate to budgeted costs and completion times. Thus, they implicitly allow for factors which impair efficiency (eg expected delays in the approval process and industrial disputes). To this extent, they probably indicate the ability to forecast cost and time rather than efficiency in construction.

APPENDIX C: INDUSTRIAL RELATIONS

1 The main players

1.1 Unions

Building construction

The principal union in the building construction sector is the Building Workers' Industrial Union of Australia (BWIU). Traditionally, this union has represented tradesmen. Since the deregistration of the Builders Labourers Federation (BLF) it has represented labourers in the major states.

In 1989 the federal branch of the BWIU attempted to merge with the Federated Engine Drivers' and Fireman's Association of Australasia (FEDFA) which represents plant operators and crane drivers. While the management of the two unions favoured merger, it was lost on a close vote of FEDFA members. The unions retain a close working relationship and often put forward joint submissions to the Australian Industrial Relations Commission (AIRC).

Metal and engineering construction

Union coverage in this area of the industry varies from state to state. As a result, there is some overlap. The main union is the Amalgamated Metal Workers Union (AMWU), which is essentially a manufacturing based union in the metal trades and covers trades classifications. The Federated Ironworkers Association (FIA) covers trades assistants.

Civil engineering construction

The principal union in civil engineering construction is the Australian Workers Union (AWU). The AWU is sometimes involved in CBD construction - usually in site preparation such as earth moving.

Demarcation disputes have occurred between the building unions and the civil and engineering unions - involving also the BLF and the FIA. More recently, demarcation between building and civil and engineering construction has been more settled, with a rule of thumb that if the construction houses people (eg housing and offices) the BWIU has coverage. On some sites this may mean both unions being represented, with two site agreements and two principal contractors. The distinction is less clear in the construction of factories and may depend on the output of the factory.

Other unions

While the BWIU is the principal union in the construction industry, there are other important unions representing particular occupations. These cover crane drivers (the FEDFA), painters, plumbers and electricians. Important craft based unions are:

- . Amalgamated Society of Carpenters and Joiners of Australia;
- . Operative Painters and Decorators' Union of Australia;
- . Operative Plasterers and Plaster Workers' Federation of Australasia; and
- . Plumbers and Gasfitters Employees' Union.

The Electrical Trades Union of Australia, while not formally regarded as a construction union, has a significant role in the construction industry.

The BLF has been deregistered federally and in New South Wales, Victoria and the ACT. Branches continue to operate in the other States. The BWIU has applied for coverage of labourers in States where the BLF is still registered under state law.

Union amalgamations

The BWIU sees itself as the basis for a new union to be called the Construction, Forestry, Mining and Energy Workers' Union. It anticipates that it will become the major union in construction and in the building pre-fabrication components industry, as well as the major union in mining with a significant presence in the power generating industry.¹ The other craft based unions such as the painters, plumbers and electricians, currently oppose amalgamation.

The BWIU and the AMWU have (unsuccessfully) attempted to negotiate swaps of union members - essentially aimed at BWIU members in the manufacturing sector joining the AMWU, and AMWU members in the construction industry (such as welders and boilermakers) joining the BWIU. This had the objective of strengthening the industry focus of the two unions and reducing overlap into each other's industry.

While negotiations between unions are being held, the concensus appears to be that an industry union in the construction industry is still many years away.

Many, but by no means all, employers favour a single industry based union. Shell commented that industrial relations are being complicated by the need to negotiate with the nine unions involved in the Geelong refinery project. The single union is not seen as ideal by employers, but it would be an improvement over the current situation. Negotiation would be far easier if there were only one union as current unions have a different attitude to restructuring. With one union, however, employers will still be negotiating with a number of smaller groups within the union.

1.2 Employer organisations

The Australian Federation of Construction Contractors (AFCC) represents the larger construction companies in the industry. The other major employer group is the Master Builders Construction and Housing Association of Australia (MB-CHAA) - which recently changed its rules to include subcontractors and suppliers to the industry.

¹ McDonald (1990a, p.4).

Smaller subcontractors are represented by individual associations and through an umbrella organisation, the Building Industry Specialist Contractors Organisation of Australia (BISCOA). The Metal Trades Industry Association (MTIA) also has a role in the construction industry, particularly in engineering construction.

2 Awards

Most construction employees are covered by federal awards. There are general federal construction awards as well as awards covering particular occupations such as plumbing. Engineering construction is now covered by a separate metal and engineering construction award. Until recently it was covered by an appendix to the metal industry award.

Until 1989, the construction awards were ‘paid rates’ awards, that is they stipulated actual rates of pay for construction employees. Over-award payments were not permitted but nevertheless were widespread in the CBDs. However, there was provision for variations to the award, mostly the payment of site allowances.

The paid rates awards contributed to many of the problems in the industry as people attempted to get around the restrictions of the award. Inquiry participants said that there were many ways of doing this including cash in hand payments, listing employees as subcontractors, booking up unworked overtime, or employing workers at higher job classifications.

Following a determination by the AIRC in 1988, the federal awards were changed to minimum rates awards and the AIRC no longer ratifies site allowances. As a result, across-the-board site allowances have become widespread.

State awards ‘mirror’ the rates and conditions of federal awards. That is, changes to the federal award are generally incorporated in the State awards.

3 Site agreements

Pay and conditions (in addition to those set out in awards) on large building sites are often set out in a site agreement.²

Site agreements are generally negotiated by the principal contractor or by an agent, such as an industry association, on behalf of the client. Construction does not normally commence until the site agreement is finalised. The finalising of an agreement can sometimes be the cause of lengthy delays. Participants commented that the amalgamation of unions could help reduce these delays.

All subcontractors subsequently coming on to the site are required to abide by the agreement. This is a source of some dispute between employers and subcontractors. BISCOA complained that agreements are worked out by organisations such as the AFCC representing the principal contractor and the client, but then applied to subcontractors on site.

Site allowances are highest in the CBD. For example, in Melbourne the site allowances are \$2.20 an hour in the CBD, \$1.90 in St Kilda Rd, and as low as \$0.50 in the suburbs.³ A similar situation applies in Sydney.

Adherence by the workforce to site agreements came under considerable criticism from some employers - to the extent that they were said to be essentially token - at least as far as enforceability went. According to some, what happens on the site is totally divorced from industry level agreements.

4 Agreements outside the Industrial Relations system

The negotiation of state-wide industry agreements outside the formal industrial relations system is increasing. These principally relate to site pay and related conditions, and conditions additional to those specified in the awards. The Victorian Building Industry Agreement was the first of these. It sets out the site and labour conditions on sites throughout Victoria and has been agreed by the building employer groups, the Victorian Government and the main unions. Similar building agreements are in place in some other states. They are becoming increasingly significant in these states.

² The definition of a large site varies. It can be as low as \$1 million.

³ Victorian Building Industry Agreement 1989-1992.

5 Dispute settling procedures

5.1 Private arbitration

Private arbitration by disputes boards, outside the formal conciliation and arbitration system, is an increasing feature of the construction industry. Private arbitration was pioneered in Victoria but some other states, notably Western Australia, now use it. Private arbitration is publicly funded in Victoria. The procedures are informal and precedents are not established. There are no transcripts. One of the big gains is a speedier settlement, and private arbitration can arbitrate on payment for lost time. The AIRC can find there is a dispute, but not arbitrate on payment for lost time. The MB-CHAA said that use of the private system often shortens the dispute, as work resumes once it is learnt that the matter has been referred.

6 Award restructuring in the construction industry

In August 1988, the then Australian Conciliation and Arbitration Commission established a new wage system based on the Structural Efficiency Principle (SEP). This linked wage increases to the overhaul of awards to do away with outmoded provisions. Major priorities are the revision of job classifications, multi-skilling and the provision of new career paths underpinned by major changes to skill formation and training arrangements.

Within the construction industry, change is directed at the rationalisation of awards, simplification of classifications, establishing career paths, and the introduction of formal training associated with the proposed career paths. These changes are currently before the Industrial Relations Commission and are expected to become operative in March 1991.

6.1 Award rationalisation

The core of the award rationalisation proposals in the construction industry involves amalgamating the three on-site construction awards⁴ into one, and the rationalisation of relativities with the National Metal and Engineering Construction Industry Award.⁵ The negotiations also include the amalgamation of the three plumbing awards into one award.

6.2 Classifications

Existing classifications are being rationalised into a broadly agreed nine step scale. Pay will be determined by position on the scale and expressed as a percentage of a tradesman's base rate. The lowest entry or training wage has not been agreed and negotiations between employer and employee organisations are continuing on where an existing skill will fit onto the new scale.

A concept of skill streams has been developed as a framework for training, accreditation and career paths in the industry. Four streams are proposed and are under negotiation. These are: structures; internal finishes and fit-out; mechanical services (covering such things as air conditioning, lifts, electrical work and plumbing); and civil\operating (covering such things as earthworks and road making).

The purpose of the streams is to give the industry some manageable areas of skills in which to plan career development and skills formation. In any one of the skill streams, a worker will be able to reach a basic level of proficiency. Workers will be able to develop some specialised skill to a higher degree and have access to the higher rates of pay provided by the new classifications. The most highly paid workers would be those who achieve a high level of skills in a number of specialisations.

⁴ The three awards are:

National Building Trades Construction Award:

National Building and Construction industry (FEDFA) Award; and

National Building and Construction Industry On-Site (Labourers) Award.

⁵ This is now a separate award. This part of the industry was, until April 1989, covered by an appendix to the metal industry award covering on-site construction work. It broadly covers engineering construction.

Existing workers will be slotted into the new structure (with no loss of income). The principles under which future payments will be made include:

- . Payment will relate to documented accreditation of skill and responsibility;
- . Pay levels will be determined by the combination of linked skills accredited within a stream;
- . Accreditation will be awarded when workers achieve prescribed national standards of competency; and
- . Workers must be willing and able to use all skills paid for if asked to do so by their employer.

6.3 Training

Current situation

Apart from a handful of one-off modules, little formal off-site training is available for non-trades workers. Workers employed at trade level are deemed to need to undergo, in most cases, a four year apprenticeship. In fact, more than half of the building workers employed and paid as a tradesperson have not undergone any relevant formal training.⁶ The level of formal training is higher for the licensed trades of plumbers and electricians where formal qualifications are necessary to obtain a licence.

The firms which employ and train apprentices are predominantly the larger construction companies which have a permanent work force. However, the industry is dominated increasingly by smaller sub-contractors who rarely take on apprentices and who do not have the necessary range of jobs for the broad formal training required.

The problems of maintaining the traditional level of apprenticeships in the industry has resulted in the setting up of a Group Training Scheme run by the MBA and the HIA. This scheme is now the biggest employer of apprentices in the industry and

⁶ AFCC (1990, p.2).

runs in parallel with private employers' apprenticeships. The apprentices are hired out to members as needed, but they remain employed by the Scheme.

The dominance of sub-contracting (at least in the non-housing sector) results in a more narrow specialisation than the current award structure would imply, for example a carpenter who just hangs doors. This very narrow specialisation reduces training needs. The unions see this as a de-skilling of the construction workforce.

Proposed training

. Accreditation

The proposed system is based on universal accreditation beyond the basic pay levels and industry recognised assessment of competency. There is as yet no infrastructure within the industry with the resources to introduce such a system, but it is envisaged that the National Training Board will develop the necessary infrastructure.

The NBCITC (National Building and Construction Industry Training Council) will be responsible for setting training standards and accreditation. It aims to make accreditation nation wide to overcome existing problems of some qualifications not being accepted in some states.

Transitional arrangements involve the 'automatic' accreditation of workers at the level at which they are currently carrying out work. Some workers may have higher skills and will be able to undertake one-off competency assessments early in the transition to the new structure.

. Training leave

The position of the unions is that all training must occur in working time, and that this must be paid time. Employers have not accepted this and argue that the employer should only be required to make a contribution to training leave if the skill is required by the employer.

. Delivery of training

Mechanisms for the delivery of training, and indeed the curricula themselves, are still in the planning stage. Proposals include a significant degree of on-the-job training, but with a more formal recognition of the skill gained and the formal recognition of more experienced workers as training providers. The establishment of training divisions within companies, or of separate training companies, is also being considered. The existing TAFE system was seen to be too inflexible to be the prime vehicle for delivering training.

. *Induction training*

Induction training has also been proposed for the industry, but neither the type of training nor the rates of pay and conditions for new entrants have been agreed.

. *Apprenticeships*

In the trades area, modification of the apprenticeship system is being considered. Its aim is a less onerous apprenticeship of some two to two and a half years rather than the current four years, with qualifications based on competency rather than serving prescribed periods of time. Apprenticeship training will be one of the introductory mechanisms for workers in the industry with access to training modules for subsequent movement along the career path.

The modification of current apprenticeships to match the proposed work streams in the industry is being considered.

. *Training levy*

Money raised under the Commonwealth Government's training guarantee (levy) scheme will go towards funding the proposed training arrangements.

The consequences of overlap with existing and proposed state levies, such as that in Western Australia and Victoria, are being reviewed. Some employers expressed the

view that if a state scheme already exists, an exemption from the Commonwealth's 1 per cent levy should be available. The Commonwealth Government's position has not been finalised.

7 Industrial Relations in the USA and UK Construction Industries

7.1 United States⁷

There are 15 unions representing different trades in the construction industries in the USA. Each union is divided into 'locals' with responsibility for specific geographic jurisdictions. In total there are some 5 500 local unions.

Labour laws in the USA require employers generally not to recognise a union until employees select the union as their representative through a legal election process. The construction industry, however, is exempted from this process. Construction employers can negotiate labour contracts with unions before workers are engaged. Hiring is then undertaken through the respective unions which maintain hiring lists.⁸ In recent years, as the proportion of union contracts has declined, greater numbers of unionised workers have pursued work through open-shop (or non-union) arrangements.⁹

A substantial component of the construction industry workforce in the USA is non-unionised. Union coverage in the industry has been declining. Union membership for all construction occupations in 1986 is estimated to have been 22 per cent.¹⁰

⁷ Information on the US construction industry is based predominantly on Bell (1988).

⁸ 'Right to work' laws have been enacted by many States. They protect the right of workers to be employed without having to join a union, even when it has been recognised by the employer as the bargaining agent.

⁹ Allen (1988, p356).

¹⁰ Allen (1988 Table 1).

The major body involved in mediating labour disputes, the Federal Mediation and Conciliation Service, is available, but is rarely used in the construction industry.¹¹ Within the industry, negotiations between contractors and unions are usually conducted at the local level. However, as the cohesiveness of local bargaining groups began to deteriorate with the growth of non-union competition, major contractors in the 1980s began to rely more on negotiating labour contracts for specific projects, called 'project agreements'. These agreements have been used to prohibit strikes. Since the late 1980s, major contractors have gone one step further and entered into standardised nationwide agreements for industrial projects.

Management has relied primarily on unions to handle training in the construction industry. Unions have operated local and regional apprenticeship programs based on joint labour/management trust funds. These funds are maintained through employer contributions based on the number of union employees. Efforts have been made by non-union firms to run some training programs, but these have been limited. According to a key American practitioner in the industry, "apprenticeship training programmes are in serious disrepair or are generally inactive."¹²

The unionised sector of the industry had a productivity advantage in the early 1970s. By the early 1980s it had disappeared. This has been attributed to the increased proportion of union members working in open-shops and the increased experience of open-shop contractors in large scale projects.¹³ The decline in union coverage had by the late 1980s stabilised and union wage reductions seem to have run their course.¹⁴

A loading is generally built into wage rates to cover holidays and inclement weather.¹⁵ This is sometimes referred to as the 'no-work, no-pay' principle.

Wage rates and conditions of employment vary greatly depending on the geographic area and whether the site is unionised or not.¹⁶ In large industrialised cities where unions have effective control of the workforce, much higher rates of pay apply. Another factor is the application of the Davis-Bacon Act which sets minimum

¹¹ For more information about the operations of the FMCS, see Blain, Goodman and Loewenberg (1987 pp 179-198).

¹² Bell (1988).

¹³ Allen (1988 p 357)

¹⁴ Bell (1988).

¹⁵ Ireland (1988b p 125).

¹⁶ In the mid 1980s, wage rates for labourers ranged from \$9.67 to \$23.03 per hour according to Flanagan, et al (c.1986 p 49).

wages for federally funded construction projects, with similar legislation at the State level. Under the Act, the Department of Labor sets wage rates at a level substantially above the open market rate for particular localities.¹⁷

7.2 United Kingdom¹⁸

Voluntary collective bargaining dominates industrial relations in the UK, with third-party conciliation and arbitration being a small element in dispute resolution.¹⁹ The Government can and does set some minimum employment standards by legislation. However, beyond this, wages and employment conditions are matters for agreement between the employer and the worker, or in other cases for collective agreement between unions and employers.

Non-residential building work in the UK is heavily subcontracted. Direct employment is more common in engineering construction, but this too is being subcontracted to a greater extent than previously. Over 50 per cent of building workers are estimated to be self-employed.²⁰

The construction industry (excluding housing) is covered by a series of voluntary collective agreements (called 'working rule agreements'). The Building and Civil Engineering Joint Board (BCEJB) negotiates major terms and conditions of employment. It comprises representatives of the main unions and employer associations. Each of these two sectors has its own working rule agreement which incorporates the matters agreed by the BCEJB. The National Joint Council for the Building Industry and the Civil Engineering Construction Conciliation Board negotiate the detailed working rule agreements which are reviewed annually. These bodies also have dispute settlement functions.

¹⁷ Flanagan, et al (c.1986 p 49)

¹⁸ Information on the UK construction industry is based on Lovell (1989).

¹⁹ Blain, et al (1987 p 189).

²⁰ The incidence of self-employed in engineering construction is much less than in the building sector generally according to Lovell (1989 p 5).

Another body, the National Council for Engineering Construction, performs a similar function for the heavy engineering sector. It does not rely solely on a working rule agreement and can nominate very large projects for additional consideration, these being subject to special site agreements along similar lines as Australian major projects.

The working rule agreements are not unduly prescriptive and much of the actual remuneration is fixed by the employer on site, usually after negotiation. Third party intervention (including that by employer associations) is restricted, with wide scope for site level negotiations.

Wage rates in working rule agreements are therefore minimum rates (or base rates) with a 'plus rate' for non-tradesmen exercising extra skills, and a guaranteed minimum bonus. These rates are generally supplemented by a bonus scheme (especially on large sites), apparently tied to production, which subsumes the guaranteed minimum bonus.

Regional and national conciliation committees, comprising employer associations and unions, are used to resolve industrial disputes. This process appears to work successfully with committees being able in almost all cases to reach a recommendation. Lovell (1989, p 11) suggests three reasons for this success. Firstly, the committees are often places of last resort and the parties are likely to be genuinely seeking a solution. Secondly, if the committee procedure fails there is nowhere else to go. Finally, on the national committee are people who were personally involved in negotiating the working rule agreement. These individuals have a strong incentive to come up with a joint recommendation to ensure continuation of that agreement.

The tripartite Construction Industry Training Board makes grants to accredited providers of training within the industry. The grant is made from a fund that receives contributions by way of a compulsory levy on construction industry employers of 2 per cent of payroll.

APPENDIX D: INDUSTRY CROSS-SUBSIDIES IN WORKERS COMPENSATION

In a recent analysis of workers compensation systems in Australia, it was noted that industry cross-subsidies were significant in certain States.¹ As these arrangements appeared to favour construction, the extent of cross-subsidies has been investigated for the current inquiry. The finding is that any benefit to construction has been largely eliminated through recent reforms.

Traditionally, premiums for workers compensation have been set on a 'user-pays' basis, in which employers are charged differential premium rates, according to their relative risk. In the 1980s, however, several States adopted a 'community rating' system in which risk-related criteria were relaxed. In these States - New South Wales, South Australia and Victoria - the structure of premium rates was compressed, so that low-risk industries were subsidising more hazardous sectors. In the long-run, the outcome of such arrangements is an inefficient allocation of resources. Industries with dangerous working conditions produce more and are more labour-intensive, compared with a user-pays system, while the opposite is true for other industries.

The relatively hazardous nature of construction can be inferred from employer costs for workers compensation. In 1987-88, these amounted to 4.2 per cent of total employee labour cost in construction, as compared with 2.5 per cent across all sectors (Table D.1). On this evidence, the adoption of a community rating system should lead to an expansion of the construction industry. However, the magnitude of this effect would be dampened by another characteristic of the construction industry - namely, the high incidence of self-employment. In March 1990, the self-employed share of the workforce was 34 percent in construction, versus 13 per cent in other industries. Since the self-employed are not covered by workers compensation, any subsidy to construction applies to wage and salary costs only.

¹ IAC 1989

Further, even with respect to wage and salary costs, the subsidy to construction is very small. In New South Wales, planned cross-subsidies were recently abolished, so that any remaining cross-subsidies are those which are inherent in an insurance scheme (ie, those which are due to the difficulties in risk assessment). In the other States which adopted community rating - Victoria and South Australia - there has also been a drift back toward the user-pays philosophy, and subsidies to construction are now minor. Details of the financing arrangements in these States and New South Wales are provided below.

The extent of intra-industry cross-subsidies, between employers classed in the same industry, is not examined. In each of the States considered, these subsidies are limited by a bonus and penalty scheme, which accounts for the recent claims experience of individual employers.

Table D.1: Workers Compensation Cost as a Share of Employee Labour Cost, Australia, 1987-88

<i>Industry</i>	<i>Per cent Share</i>
Mining	3.4
Manufacturing	3.4
Electricity, gas and water	2.5
Construction	4.2
Wholesale and retail trade	2.2
Transport, storage and communication	2.6
Finance, property and business services	0.9
Public administration, and defence	2.4
Community services	1.7
Recreation, personal and other services	2.1

Source: Australian Bureau of Statistics, *1987-88 Major Labour Costs, Australia*, Catalogue No. 6748.0.

South Australia

The current system of workers compensation - known as WorkCover - commenced in September 1987. WorkCover assesses a levy rate for each industry, using an industry classification based on ASIC.

Table D.2: **Workers Compensation Levy Rates for Construction Industries, South Australia** (per cent)

<i>Industry</i>	<i>Risk-Related Rate^a</i>	<i>Actual Rate^b</i>
House Construction	4.6	4.7
Residential Building nec	9.6	7.5
Non-residential Building nec	6.5	6.7
Road and Bridge Construction or General Repair	5.7	6.0
Non-building Construction nec	6.4	6.7
Concreting	9.7	7.5
Bricklaying	10.9	7.5
Roof Tiling	7.1	7.5
Floor and Wall Tiling	4.8	5.3
Structural Steel Erection	7.3	7.5
Plumbing Draining or Septic Tank Installation	6.8	7.5
Electrical Work	4.6	4.7
Heating and Air Conditioning	5.2	5.3
Plastering	7.1	7.5
Carpentry	6.9	7.5
Painting	6.6	7.5
Earthmoving and Dredging	6.9	7.5
Special Trades nec	7.1	7.5
All Construction	6.5c	6.6c

a Estimates based on claims data for the 27 month period to 1 July 1990: estimates are subject to error, particularly for small industries.

b Effective 1 July 1990.

c Calculated as weighted averages, using non-exempt wages as weights.

Source: WorkCover Rehabilitation and Compensation Corporation, South Australia.

In 1989-90, there were ten levy rates ranging from 0.5 to 4.5 per cent of wages. For the current year, 1990-91, this has been replaced with a 24-rate scale, with a minimum of 0.4 per cent and a maximum of 7.5 per cent. As a result, cross-subsidies have been significantly curtailed, and now benefit only the riskier industries in the top category. The target average levy rate is 3.8 per cent.

For construction, WorkCover's estimates of risk-related rates are compared with actual levy rates in Table D.2. The industries which are subsidised are residential building (excluding houses), and two of the special trade industries- concreting and bricklaying. The largest of these subsidies (for bricklaying) is 3.4 per cent of wages. Other industries in construction are effectively taxed. The construction sector as a whole is not subsidised: in terms of averages, the actual and risk-related rates are nearly equal.

The fact that a system which subsidises risky industries does not benefit construction requires some comment. According to Table D.2, the share of workers compensation in labour cost is greater in construction than in any other industry division. Thus, at the broad sectoral level, construction is likely to be the riskiest industry in a given State. However, in the South Australian system, the industry categories are much less aggregated, and only the extreme-risk industries are subsidised (ie, industries with a risk-related rate in excess of 7.5 per cent). The construction sector as a whole, while relatively risky, does not meet this threshold.

Victoria

The financing of workers compensation in Victoria is similar to that in South Australia. Premiums are collected through industry levies, with industries defined at the 4-digit ASIC level. The premium rate is an increasing function of risk, subject to a floor and ceiling rate. The average levy rate among all industries is 3.3 per cent.

When the current WorkCare system was introduced in late 1985, it represented a sharp departure from the previous 'user-pays' system. At the outset of WorkCare, premium rates varied over a narrow range between 0.57 per cent and 3.8 per cent of wages. However, in late 1989, these were replaced with the current levy structure, which is considerably less compressed. There are now 16 levy rates, ranging from 0.44 per cent to 7.7 per cent.

It is difficult to gauge the extent of remaining cross-subsidies, since WorkCare estimates of risk-related rates are not available. In this situation, it would seem reasonable to compare current premium rates with those pre-WorkCare. Prior to WorkCare, premiums were sold by private insurers at market-determined rates. To facilitate this process, the Victorian government published advisory rates which were based on risk assessments. However, these rates were based on unreliable data and were not closely adhered to by insurers. Moreover, there are two other problems with the proposed comparison. First, due to changes in administrative arrangements and benefit provisions, the structure of risk-related rates will have changed with the introduction of WorkCover. Second, the classification in the advisory schedule was based on both occupational and industry criteria, and is not comparable with the current industry classification based on ASIC. Thus, while advisory rates between 15 per cent and 22 per cent were set for 'building and construction', these rates cannot be generalised to ASIC construction. In particular, it should be noted that clerical workers were placed in a separate advisory category, irrespective of industry. Since these workers incur relatively small workers compensation costs, the advisory rates for industry categories, such as building and construction, were thereby increased.

Similar problems are involved in inter-state comparisons. However, as was noted above, the levy structure in Victoria is similar to that in South Australia, the only other state which uses the ASIC classification. In view of this, it is tempting to conclude that any subsidy to construction is small. As a further check, rough estimates of risk-related rates were derived from claims ratios (the ratios of claims payments to wages). Computationally, the claims ratio in the construction sector was divided by the claims ratio for all industries, and this factor was multiplied by 3.3 per cent (the average levy rate). The data for this calculation relate to wages and incurred claims for the period September 1985 (when WorkCare commenced) through June 1988. Note that a claim is 'incurred' when the injury is first reported, and that payments on claims can continue long after they are incurred. In the data used for the present exercise, payments are measured through 30 January 1989. Ideally, the data would include estimates of outstanding liability, since a characteristic of workers compensation is that long-term claims account for most payments. Unfortunately, the estimation of outstanding liability is notoriously difficult, and WorkCare does not attempt this at the industry level, except on an ad hoc basis for extreme-risk industries.

For all construction industries, the rough estimate of the risk-related rate is 4.5 per cent, which is less than the average levy rate of 5.2 per cent. It is not possible to determine the bias in this comparison which results from the lack of data on outstanding liability. However, data are available on total claims as well as the number of claims which are long-term to date. (ie, claims which have been active for at least 52 weeks, as of 1/30/89). As it turns out, claims in the construction sector are relatively short: only 6.1 per cent of claims are long-term (in the above sense), as compared with 9.6 per cent in all industries. This comparison supports the conclusion that construction is not subsidised. It suggests that the estimate of construction's risk-related rate is, if anything, an overestimate.

Other biases in the above estimate are more difficult to assess. A general problem is that historical data may not be indicative of current patterns. This could be due to various factors: changes in the administration of workers compensation or in benefit provisions, industry trends, or random fluctuations. Suppose, for example, that recent changes in administration have reduced the incidence of fraud. In this case, the historical data will exaggerate the riskiness of fraud-prone industries relative to other sectors.

Despite such problems, it would seem unlikely that construction is significantly subsidised under WorkCare. This is in contrast with the meat processing industry, which pays a levy rate of 7.7 per cent, although its risk-related rate is probably above 20 per cent.² Other industries which are subsidised include clothing and footwear, motor vehicles and railway rolling stock.³

² Accident Compensation Commission, *1998-89*, p.13

³ IAC 1989, p.17.

New South Wales

In New South Wales, as in South Australia, the system of workers compensation is known as WorkCover. Levy rates are assessed for each industry in a special classification, which is not comparable with ASIC. In 1988-89, cross-subsidies between industries were fairly modest, amounting to less than 2 per cent of premiums paid. This was significantly less than in the previous year, the first year of WorkCover's operation. The new levy structure which was announced for 1990-91 marked the culmination of this trend, with a complete return to a user-pays system.

Industries in the construction sector generally pay the maximum rate of 8.4 per cent. The major exceptions are road and bridge making, and construction of waterworks (including dock facilities). The current rates in construction are far lower than those under the pre-WorkCover system, even though both schedules are based on the 'user-pays' principle. In 1986-87, the general rate for construction industries was 27.9 per cent. The difference between this and the 8.4 per cent rate which prevails at present is largely explained by two factors. First, whereas clerical workers were assigned a separate premium category under the old system, they are distributed across industry categories under WorkCover. Second, due to changes in administration and benefits, there has been a system-wide decline in premium rates, with the average rate falling from 3.8 per cent in 1986-87 to 2.0 per cent in 1990-91 (projected).

APPENDIX E: COMPARATIVE CAPITAL COSTS

A comparison of the capital costs of constructing a 1200 tonnes per day bleached hardwood kraft pulp mill in Australia, Canada and Chile

This appendix reproduces the report of a study commissioned from Simons Strategic Services.

**COMPARATIVE CAPITAL COSTS OF
A 1200 TPI) (420,000 TONS CAPACITY PER YEAR)
BLEACHED HARDT~OOD KRAFT PULP MILL**

1.0 Introduction

The Industry Commission 0-Australia is seeking to identify how cost competitively a bleached kraft pulp (BKP) mill can be planned and constructed in Australia compared to other key regions of the world which would compete with Australian producers.

This study is a follow up to the March, 1990 report "Competitiveness of Australian Forest Industries" produced by H.A. Simons for the Forestry and Forest Products Industry Council (FAFPIC) of the Australian Manufacturing Council (AMC).

This study has certain key differences to the AMC study. It is primarily an estimation of total capital costs for a mill in each of three countries (Canada, Chile and Australia) based on a relatively current valuation. These estimates are considered to be order of, magnitude and give a broad estimate of likely project costs. The values for this study, use representative currency exchange rates as of June, 1990.

The AMC study used trend line currency exchange rates based on the historical period of 1970-1988. This was done to portray a comparison of competitiveness over that period of time from region to region.

To use the same trend line currency exchange rates to present a valuation of total capital cost would be confusing as the general objective of this study is to identify current costs and key reasons for differentials in cost in each country.

Currency exchange rates have changed significantly for Canada and less significantly for Australia vs. the US dollar. Both currencies have strengthened since 1988 and are well above the trend line values used in the AMC report. These changes are summarised as follows.

Currency Exchange Factors

Stated in US Dollars	Avg. 1988	AMC Trend Line	June 1990	Increased Value Over Trend Line
Canadian \$	0.81	0.73	0.858	17.5%
Australian \$	0.78	0.73	0.793	5.7%

While both of the above currencies have strengthened vs. the US dollar since 1988, the Chilean peso has decreased in value by 22% in the same time period.

The major not result of these 'fluctuations has been to reduce the capital cost of a Chilean mill from the value which was used in the AMC study. This is due to the fact that the majority of expenditures in a project would be paid out in local funds--construction labour, materials, etc. and when converted to Australian dollars, these costs would be lower.

2.0 Scope of the Project

The mill used for the cost comparison is a hypothetical 1200 metric tons per day (420,000 tpy) capacity bleached hardwood (BHKP) kraft pulp mill. Costs have been based on current estimates of projects presently under study, design or being constructed in the countries being compared.

The costs involved in the mill planning and construction are broken out into their key cost components including the main components of direct and indirect costs.

Direct costs include cost outlays for site preparation, buildings and equipment. Indirect costs include temporary construction facilities, consultancy and engineering as well as spare parts.

In addition to the direct and indirect cost categories, there are other costs associated with a venture of this scope. These additional items are not as costly, but are, nevertheless, significant capital requirements. They include the cost of land, interest on borrowed funds during the construction period, insurance pre-operating expenses (salaries, legal fees, etc.) training and starting-up until the mill is considered to be producing saleable production.

The fully detailed outline of individual cost components examined is included in the Appendix.

In addition to the identifiable costs listed, a key objective of the study is to identify the main reasons for differences between costs at an Australian location vs. the other competing countries.

This also includes an assessment of the effects of meeting environmental standards including the length of time required to obtain approval for new projects which are environmentally sensitive.

3.0 Project Consistenc

To be consistent in the comparisons, like conditions have been used for various cost components.

An example of this is site preparation and services. The example assumes in all cases that no pilings are required and that only spread footings are used.

Individual site locations will vary in all countries compared. Therefore, requirements and costs could vary depending on the individual site chosen.

This is the case in all three countries compared. To eliminate these variances we have assumed a representative mill in each country based on actual historical projects which Simons has worked on or has knowledge of.

4.0 Summary

Total capital cost estimates excluding contingencies and escalation during the construction period are summarised as follows:

Capital Costs of a 1200 tpd BHP Mill (AUD \$0001s)

	Australia	Canada	Chile
Direct Costs	827,281	750,729	736,257
Indirect Costs	114,906	143,325	105,570
Total Construction Costs	942,187	894,054	841,827
Other Costs	143,415	129,956	119,171
Total Costs Excluding Contingency and Escalation	1,085,602	1,024,010	960,998
Percentage of Australian Cost		94.3%	88.5%

The above estimates indicate that using the average June 1990 currency exchange rates, to construct a BHP mill in Australia, costs will be approximately 6% higher than in Canada and 13% higher than a mill in Chile.

Direct costs are the major reason for the higher Australian costs as well as "other" costs. A further breakdown comparison of the direct cost category identifying the key variances is as follows:

Direct Cost Summary (AUD \$000's)

	Australia	Canada	Chile
Equipment Purchases	438,074	392,789	461,108
Material	149,513	149,535	158,494
Site Labour	239,694	208,405	116,655
Total Direct Costs	827,281	750,729	736,257

Within the direct cost category, equipment purchases account for the major difference to a Canadian mill, while a Chilean mill has an even higher equipment cost. The reason for Australian and Chilean (even more so) equipment costs being higher is that more equipment must be purchased and imported than into Canada. Therefore, countries with the weakest currency exchange rates relative to the countries supplying the equipment have the highest cost in local currency terms.

The other main differential in the direct cost category is the site labour which is highest in Australia, followed by Canada and lowest in Chile.

This is mainly due to a lower level of labour efficiency in Australia and Chile than in Canada and, in the case of Chile, a much lower labour rate per hour stated in Australian dollar terms. Indirect costs are comparable in Australia and Chile, but are significantly higher in Canada. This is mainly because of the temporary construction camp facilities required for most new Canadian greenfield mill sites which are usually located in areas distant from the main labour supply centres.

Other Related Costs

In addition to the direct and indirect capital costs, the other cost category includes several significant expenditures.

A major expenditure is working capital required to allow for the necessary levels of inventories of input materials and to finance receivables until payment is received from customers. We have assumed that receivable levels are the same for all countries, namely 45 days. These can vary significantly due to the individual market areas and customers being serviced.

The main reason that Australia has a higher working capital component is the higher input costs for wood, chemicals and labour.

5.0 Detailed Capital Cost Estimates

The detailed index and values included in the appendix represent estimates of the main category and sub-category capital costs.

The hypothetical Australian mill has been used as a base and therefore is shown as 100%.

For the Canadian and Chilean mills, each item has been indexed to the identical item on the Australian mill estimates and is stated as a percentage of the Australian item's cost. A percentage lower than 100 denotes a lower cost- and a higher percentage a higher cost than the specific Australian base mill item,

In addition to identifying the comparison of specific cost items by country, the schedules also show the percentage of each major cost item within each category (direct, indirect and other costs).

Dollar estimates are stated in Australian dollars (thousands) on all country estimates.

6.0 Discussion of Key Differences in Cost

This section of the report discusses the consultant's opinion of the major reasons for differences in capital cost used in this study.

The comparisons used are based on a general assumption that each hypothetical mill is located in a similar environment with comparable access, adequate external infrastructure (roads, power and water supply) and a sufficient supply of qualified labour force.

It must be noted that in any of the three countries compared in this study, these basic conditions could fluctuate dramatically. The result could be significant change in the capital cost of a project entirely dependent on the location of the project and construction circumstances in any of these countries. Therefore, to provide a meaningful comparison relatively like circumstances have been used for this report.

Australia Compared to Canada

Equipment

Some of the major equipment and dedicated spare parts need to be imported into Australia. The cost for these would be in the order of 165 million Australian dollars. The additional costs for export packing, ocean and inland freight, dock charges, etc. for these imports would be in the order of 43 million Australian dollars for a total of \$208 million imports. Additionally, virtually all this imported equipment is subject to import duty, usually in the range of 10%-20%. The cost of locally produced items (if available), is normally very similar to that of imports plus duty. Canada produces most of its own equipment and has a free trade agreement with the U.S.A. The cost for vendor erection supervision would also be higher in Australia as a result of the imported equipment component.

Material

Material costs in Australia would be similar to Canadian costs as it is assumed that most of the materials could be sourced from within the country or from relatively close markets.

Construction/Labour

Differences in construction methods and practices between Canada and Australia generate 30 to 40% higher manhour consumption in Australia for similar projects. Canadian

projects have access to specialist full time pulp and paper industry construction contractors and supervisors.

In Australia the contractors are often doing this type of work for the first time. Australian construction practices, such as the requirement to employ non-productive trade apprentices among other factors, results in significantly higher labour costs compared to Canada.

There are of course climatic advantages in Australia's favour compared to Canada. Australian buildings do not have to cope with snow and can be lighter and less extensive. Field construction is continuous in Australia, but in Canada is often halted in winter. Notwithstanding these comments, the Australian cost record stands, indicating the extent of the adverse cost components

Australia Compared to Chile

Equipment

A large percentage of the equipment and dedicated spare parts amounting to 416 million Australian dollars, would need to be imported into Chile. The additional costs for export packing, ocean and inland freight, dock charges, etc. for these imports would be in the order of \$A86 million dollars.

The remaining proportion of equipment would be purchased in Chile at about 10% less cost than in Canada and Australia.

The cost for vendor erection supervision would also be higher as a result of the large amount of imported equipment. This is because there would be additional travel time and cost for suppliers from the countries which have supplied equipment to attend and supervise the installation/commissioning.

Material

A large percentage of the structural steelwork and other material components including stainless steel piping and tankage, etc. must be imported into Chile, amounting to approximately 97 million Australian dollars. Additional costs for export packing, ocean and inland freight, dock charges, etc. would be in the order of A\$16 million dollars.

other materials would be purchased in Chile at about 10% less cost than in Canada and Australia. However, the stringent earthquake regulations in Chile result in considerably more quantities of local material being required in foundation work, tank bases and hold-down devices. Chile is considered to be a maximum earthquake zone as several severe earthquakes have occurred there in the past 30 years.

Construction/Labour

Depending on the volume of construction activity at any particular time, there could be an abundant supply of unskilled labour available in Chile but a shortage of skilled labour such as welders, electricians and instrumentation specialists. Considerable training is required as a result and labour productivity is well below that experienced in Canada, requiring more manpower to complete the project than in Canada and Australia. Typically this increased manhour requirement in Chile will range from 60 to 90% for similar projects in Australia.

Hourly wage rates in Chile, however, are considerably less than in Canada and Australia and the net result of less productivity combined with the lower rate is a reduction in the total labour cost of about A\$81 million, which is significantly lower than both Canadian and Australian costs. Also local regulations regarding site safety, scaffolding, welding of pressure piping etc. are not as severe as in Canada or Australia.

Other Costs

The pre-operating and training costs consist of elements of cost which are related to the operation of the mill but not to the construction of the mill. These costs include the following:

- personnel costs prior to start-up. This can include hiring managers and administration people up to two years before start-up.
- owner's administration cost prior to start-up, such as:
 - market development - A marketing manager will attempt to pre-sell a large portion of the mill's production.
 - environmental impact assessments
 - forestry related costs
 - public relations
 - government liaison relating to infrastructure
- extensive training programs for "greenfield" mills, including:
 - sending operators offshore for several weeks to receive hands-on operating and maintenance experience

-
- start-up costs which include accumulating full costs of production during the start-up phase until reasonable saleable production is being produced. Items included are:
 - labour
 - raw materials
 - utilities costs expended in testing and bringing a mill into operation before saleable products are made.

The balance of these costs are in wages and salaries.

Construction Interest and Insurance

Interest during the construction period is calculated using real interest rates. The inflation portion of the borrowing rate has been excluded. This is consistent with the other capital cost estimates used, in this study. Escalation of construction costs during the construction period has not been considered. That is, all costs are representative at a given point in time - September 1990. Real interest rates are similar in Canada and Australia. In addition, funding for major projects such as these is often obtained through international funding agencies resulting in like rate for both Canadian and Australian projects. In Chile, a country risk component of 1.5% has been added to the real interest rate. This higher rate is to hedge against such factors as political or exchange rate risk in Chile.

Insurance during construction is a relatively insignificant cost and is assumed to be equal in all cases.

Working Capital

The major component of working capital is the inventory of materials and finished product, and accounts receivable (at mill cost). Therefore, the level of working capital is mostly tied to the input prices, such as wood, chemicals, energy and labour. Both Canada and Chile have lower input costs than Australia. This specifically results in a lower working capital total required. The terms of the accounts receivable and the levels of inventories required are considered to be comparable in most inputs. The exception is Chile, where greater inventories of some materials (chemicals) are held due to possible supply problems in that country.

Environmental Considerations

In the recent past, the pulp and paper industry has been significantly impacted by growing environmental considerations worldwide. There are two aspects to this:

- the guidelines or regulations under which a facility must be constructed and operated;
- the process through which a developer/investor must go through to get a permit to construct and operate the facility.

If the regulations in a specific country or region are unreasonably prohibitive, this could have a significant impact on capital cost, resulting in requirements for increased design, equipment and construction costs as well as potential delays in construction/commissioning.

If the permitting process is not reasonable or timely, the project time horizon could be very extended. This adds risk to the project which could be reflected in additional costs such as debt financing, additional study/pre-feasibility study costs and carrying charges through an extended construction/commissioning phase.

Certainly, if the regulations or the permitting process change during the course of the project, potential for cost increases is very significant.

Currently, Australia has made good progress in developing environmental regulations for bleached eucalypt kraft pulp mills.

There is still concern, though, that some of the states have not accepted these guidelines and that there is the possibility of long delay in the permitting process. Also, due to Australia's dry climate, rivers are small, and hence, more sensitive to pollution. This must normally result in stringent permit conditions, which result in more extensive effluent treatment plants and hence cost. (e.g. River Murray).

Canada and Chile are currently revising their guidelines and are presently reviewing developments on a project by project basis.

It is Simons' opinion that the current level of activity relative to the environmental protection and the pulp and paper industry worldwide, will result in regulations and permitting processes not favouring any of the regions under consideration in this study.

Canada

Federal and provincial regulators are in the process of re drafting the regulations for air and water emissions. It is the feeling of industry representatives that the allowable levels are likely to be based on current Swedish standards.

As of the end of September, proposed pulp and paper effluent regulation have been identified under the Canadian Fisheries act and the Canadian Environmental Protection Act so that companies at least have a good idea of what the final regulations are likely to be.

Chile

Under the current government, there is considerably more review and control required for pulp and paper as well as other major projects (mining, etc.).

Chile currently is also re-drafting regulations and it may be some time before they are finalised. During the interim, Chilean authorities are also considering each major project on an individual case basis. It is felt that Chile's regulations will be drawn up to meet World Bank guidelines, which would also be similar to Swedish standards.

APPENDIX

DETAIL COST COMPARISON FOR A 1200 TPD BHKP MILL

- AUSTRALIA

- CANADA

- CHILE

H.A. SIMONS LTD.		DATE: OCTOBER 1990		ESTIMATE OF COST		
BLEACHED KRAFT PULP - 1200 mt/d		AUSTRALIA				
PROJECT NO: W251A		CON#1 = AUS\$1,081B		1/5.81 = AUS\$1,281\$		
DESCRIPTION	EQUIPMENT PURCHASE	MATERIAL	SITE LABOUR	TOTAL (\$1,000'S)	% OF DIRECT COST	
DIRECT CONSTRUCTION COSTS: ALL ESTIMATES INDEXED TO AUSTRALIAN BASE CASE						
Offside Mill Gates						
Plant Site Preparation and Services including Land Cost	100	100	100	100	4%	
Process Buildings and Service	100	100	100	100	18%	
Non-Process Buildings and Services: Offic. Shops and Storax Etc	100	100	100	100	2%	
Process Equipment * Mechanical, Piping, Electrical, Process Control including Equipment Foundations	100	100	100	100	76%	
TOTAL DIRECT COSTS:	100	100	100	100	100%	
DOLLAR AMOUNT	438,074	149,513	239,694	827,281		
INDIRECT CONSTRUCTION COSTS:						
					% OF INDIRECT COSTS	
Temporary Facilities & Services				100	10%	
Construction Camp						
Premium and Overtime Cost (Spot Overtime Only)				100	12%	
Start-up Assistance and Materials by Construction Contractor(s)				100	1%	
Contingency Costs:						
Pre-Feasibility				100		
Feasibility				100		
Definition				100	2%	
Detail Engineering & Procurement				100	55%	
Project Management						Incl. with Detail Engineering
Construction Management and Start-up Assistance				100	12%	
Inspection Services and Sub-Consultants				100	4%	
Spare Parts (General Spares)				100	4%	
TOTAL INDIRECT COSTS:				100	100%	
TOTAL DOLLAR AMOUNT				114,906		
TOTAL CONSTRUCTION COSTS:				100		
DOLLAR AMOUNT				942,187		

OTHER COSTS:					% OF OTHER COSTS
				100	17%
Owner Project Management and Administration Costs					
Pre-operating Costs	100	100	100	100	20%
Training	100		100	100	2%
Start up				100	
Commissioning				100	1%
Land Costs - Variable				100	5%
Construction Interest and Insurance				100	17%
Working Capital				100	37%
TOTAL OTHER COSTS:				100	100%
-DOLLAR AMOUNT				143,415	
TOTAL COST EXCLUDING CONTINGENCY & ESCALATION			AUST \$	1,085,602	
*Including all Freight Cost to Mill Site.					
Taxes, Duties, Equipment Vendor Reaction Supervision and Major Proprietary Spares as Applicable					

H.A. SIMONS LTD.		DATE: OCTOBER 1990		ESTIMATE OF COST	
BLEACHED KRAFT PULP - 1200 mt/d		CANADA			
PROJECT NO.: W251A		CDN\$1 = AUS\$1.0818		U.S.\$1 = AUS\$1.2615	
DESCRIPTION	EQUIPMENT PURCHASE	MATERIAL	SITE LABOUR	TOTAL (1,000'S)	
DIRECT CONSTRUCTION COSTS:					
(Inside Mill Gates)					
ALL ESTIMATES INDEXED TO AUSTRALIAN BASE CASE					
Plant Site Preparation and Services Excluding Land Cost	99	101	87	92	
Process Buildings and Service	100	100	87	95	
Non Process Buildings and Services: Office, Shops and Stores Etc.	99	100	87	96	
Process Equipment *	89	100	87	89	
Mechanical, Piping, Electrical, Process Control Including Equipment Foundations					
TOTAL DIRECT COSTS:	90	100	87	91	
INDIRECT CONSTRUCTION COSTS:					
Temporary Facilities & Services Construction Camp				87	
Premium and Overtime Cost (Spot Overtime Only)				74	
Start-up Assistance and Materials by Construction Contractors:				100	
Consultancy Costs:					
-Pre-Feasibility				100	
-Feasibility				100	
-Definition				100	
-Detail Engineering & Procurement				96	
Project Management					
-Construction Management and Start-up Assistance				101	
-Inspection Services and Sub-Consultants				100	
Spare Parts (General Spares)				100	
TOTAL INDIRECT COSTS:				126	
TOTAL CONSTRUCTION COSTS:				95	

OTHER COSTS:				
Owner Project Management and Administration Costs				87
Pre-operating Costs	123	81	151	133
Training	130		115	120
Start-up				100
Commissioning				100
Land Costs - Variable				100
Construction Interest and Insurance				99
Working Capital				63
TOTAL OTHER COSTS:				91
TOTAL COST EXCLUDING CONTINGENCY & ESCALATION			AUST \$	1,024,009
			PERCENT OF AUSTRALIAN TOTAL COST	94%
*Including all Freight Cost to Mill Site.				
Taxes, Duties, Equipment Vendor Erection Supervision and Major Proprietary Spares as Applicable				

H.A. SIMONS LTD.		DATE: OCTOBER 1990		ESTIMATE OF COST	
BLEACHED KRAFT PULP 1200 mt/d		CHILE			
PROJECT NO : W251A		CDN\$1 = AUS\$1.0818		U.S.\$1 = AUS\$1.2615	
DESCRIPTION	EQUIPMENT PURCHASE	MATERIAL	SITE LABOUR	TOTAL (1,000'S)	
DIRECT CONSTRUCTION COSTS: ALL ESTIMATES INDEXED TO AUSTRALIAN BASE CASE					
(Inside Mill Gates)					
Plant Site Preparation and Services	119	106	49	74	
Excluding Land Cost					
Process Buildings and Service	121	106	49	85	
Non-Process Buildings and Services:	120	107	49	94	
Office Shops and Storae Etc.					
Process Equipment *	105	106	49	91	
Mechanical, Piping, Electrical,					
Process Control Including Equipment					
Foundations					
TOTAL DIRECT COSTS:	105	106	49	89	
INDIRECT CONSTRUCTION COSTS:					
Temporary Facilities & Services					68
Construction Camp					
Premium and Overtime Cost (Spot Overtime Only)					50
Start-up Assistance and Materials by Construction Contractor(s)					100
Consultancy Costs:					
-Pre-Feasibility					100
-Feasibility					100
-Definition					100
-Detail Engineering & Procurement					96
-Project Management					
-Construction Management and Start-up Assistance					130
Inspection Services and Sub-Consultants					100
Spare Parts (General Spares)					94
TOTAL INDIRECT COSTS:					92
TOTAL CONSTRUCTION COSTS:					89

OTHER COSTS:				
Owner Project Management and Administration Costs				87
Pre-operating Costs	91	72	57	68
Training	108		52	71
Start-up				100
Commissioning				100
Land Costs - Variable				100
Construction Interest and Insurance				126
Working Capital				68
TOTAL OTHER COSTS:				83
TOTAL COST EXCLUDING CONTINGENCY & ESCALATION			AUST \$	960,998
			PERCENT OF AUSTRALIAN TOTAL COST	89%
*Including all Freight Cost to Mill Site, Taxes, Duties, Equipment Vendor Erection Supervision and Major Proprietary Spares as Applicable				

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