

Ref: BC;rcp

30 November, 1999

Ms Michelle Cross  
Productivity Commission  
Architects Enquiry  
Locked Bag 2  
Collins Street East  
MELBOURNE VIC 8003

Dear Ms Cross

I would be pleased to discuss the attached paper and other issues with the Productivity Commission. Productivity and efficiency are major drivers in my own philosophy of architecture and building.

I graduated as an architect in 1966 and have been registered since 1968. I have worked for Federal and State Government agencies, have spent some 15 years in CSIRO and have been a senior manager in Thiess for the past 13 or so years.

In that 13 year period the company has grown from a turnover of \$240M to some \$1.8Bn last financial year. The company is currently growing at the rate of 18 to 20% per annum - mostly as a result of adopting new and more efficient management and operational processes directed towards improving our client businesses.

In that 13 year period we have moved from being a low end hard dollar" contractor to becoming a "high end one stop shop" for a limited number of clients. Over 80% of all work done is now repeat business for those clients.

For most of this "high end" construction business we engage and manage the architectural, engineering and financial consultants.

This method of facility delivery will become the norm" in the 21st century and will have wide ramifications for the practice of architecture and indeed engineering.

The paper I have developed, attempts to show just how the practice of architecture has evolved and where it is heading. It is a personal view, but one based on wide experience and a scientific approach to the analysis of business.

Other people who may be able to contribute to your enquiry into Legislation Regulating the Architectural Profession are:

- Mr Ian Buchan, Business Development Manager Thiess Contractors, 26 College Street, Sydney 2000
- Mr Edwin Codd, Codd Stenders Architects, 163 Annerley Road, Dutton Park

I am not sure how wide the terms of reference of the productivity Commission are - but I would be very interested in seeing a review of the practice of architecture and engineering within government agencies such as CAMS in WA, Public works NSW and Public Works and Housing Queensland.

I believe the high cost of public infrastructure can in most cases be sheeted home to the inefficiencies that result from restrictive work practices in these organisations. The adoption of "PWD Standards", "Department of Transport Standards" or "Department of Health Standards" instead of BCA or SAA standards is in most cases a mechanism to preserve the position of the organisation and to protect technical employment within them.

In addition to the paper I have written for the Commission, I have also attached a paper which I wrote and delivered to the Building Science Forum of Australia (13FSA) on 20 October 1999 in Sydney. This refers to the need in Australia to increase the efficiency of our infrastructure in order to become/remain competitive in a global market. The efficiency of the practice of architecture and engineering is bound up with this equation.

I would like to wish the Productivity Commission well in its deliberations. I would also like to wish staff a blessed Christmas and a Happy New Year.

Yours sincerely

(signature)

William (Bill) Curnow  
Executive Manager, Social Infrastructure  
Thiess Contractors Pty Ltd

# REVIEW OF LEGISLATION REGULATING THE ARCHITECTURAL PROFESSION

Paper Presented by  
William (Bill) Curnow, BArch, Executive Manager Thiess Contractors Ply Ltd

## INTRODUCTION

It has been observed many times that we live in a world in which the only constant is change.

Architects practice their profession in this world. If we are to review the legislation regulating the architectural profession then we need to review it in the context of architectural practice as it will apply in the new century rather than how it applies now in the 20th century.

## A Potted History of the Architectural Profession within Construction

Architecture may not be the oldest profession but it certainly dates back to ancient times. The architect was the person able to visualize and oversee the construction of temples, castles and the general infrastructure of cities dating from perhaps 20,000 BC in Mesopotamia and Harrapa in Ancient India. He (or she) acted as head contractor on behalf of the king or emperor. The architect was an educated person who had the greatest knowledge on the then known construction industry.

In medieval times the architect was still in effect the master builder. Again he (or she) was an educated person, by now able to commit ideas to paper, and generally acted on behalf of the king or emperor as sole owner of the wealth of the kingdom.

With the evolution of a modern society in which wealth could be accumulated by individuals, architecture became a profession to some extent independent of the king and government. However, government remained the main users of architectural services.

As architecture became an independent profession, construction also became somewhat independent. Construction began to be executed by artisans managed by a senior artisan as opposed to the former practice where the architect was in effect head contractor. In the new arrangement, the architect was still the dominant person in the building delivery process. The builder did as he was told and tugged his forelock in deference to the architect

Buildings from ancient times to the end of the 19<sup>th</sup> century had little by way of technology to concern the architect. His interest lay in aesthetics and a good knowledge about a few simple building materials including stone, brick, timber and latterly iron and steel.

The 20th century brought technology to construction. The reticulation of services such as gas and electricity and then lifts and mechanical ventilation. Initially such services were simple and were accommodated by the architect with little difficulty. Services were installed by artisans without much in the way of engineering sophistication.

By mid 20<sup>th</sup> century, however, there was a dramatic increase in the level of sophistication of buildings. High rise buildings that emerged in Chicago in the 1920's and in New York in the 1930's spread throughout the world. Services became sophisticated. Civil, hydraulic, electrical and mechanical

engineering professions that had developed within industries of the industrial revolution now became part of the building industry.

Architects continued to lead and control the design of buildings and builders continued to be managed by mostly carpenters who understood the construction process as a whole. Aesthetics were still the main concern of the architect. How the engineer fitted in his services and how the builder put it all together with their problems.

Architectural schools in the 1940's to 1960's were still turning out graduates who could recognise the classical styles of architectural of the ancient world but who knew less and less about the engineering systems that would be needed for modern buildings, and even less about the problems of the old style builder in putting them together.

With the 1960's came the professional builder. The modern society needed sophisticated roads, bridges, dams, power stations and water treatment systems. Professional civil engineers began to emerge as managers of the companies which could organise the engineering infrastructure of a modern society.

It was a natural progression for engineering construction companies to take over the traditional building construction companies.

Architects were no longer faced with the forelock tugging artisan (carpenter) who did as he was told, but rather by a highly skilled engineer who was prepared to argue. The traditional hard dollar contract system however gave the traditional architect final say in most matters.

Under the traditional "hard dollar" method, the client (owner) engaged an architect to design a facility. The architect engaged consulting engineers on behalf of the client and co-ordinated their inputs into the design. It was the architect's responsibility to keep within the client's budget and to ensure that all the client's needs were met. The architect called tenders and awarded the construction contract to a builder on behalf of the client. The architect then supervised the construction on behalf of the client.

Under this procurement method the builder is entitled to extra payments for inadequate or missed out information. If the architect forgets something the client needed, the builder must be paid for the extra work and for any delays that may occur as a result.

The traditional method also tends to reward the architect and other consultants for inefficiency in their design work. The more difficult a solution is to build, the higher the price. The higher the price, the higher the consultant fees. On the other hand, simplification of design, rationalisation of details and refinement of the design to speed construction, all resulted in lower cost to build and lower fees to the consultants.

In other words, the form of consultant fees expressed as a percentage of construction cost is inherently flawed. It rewards incompetence and disadvantages the architect and engineer who are prepared to work hard to simplify the process. (The attached diagram shows the different costs for a range of related projects under various methods of procurement).

The lack of skills by many architects in understanding the heavily serviced modern building needs, the increasingly sophisticated building component manufacturing industry and the increasingly, complex building industry, inevitably led to difficulties. CSIRO building research showed that most buildings undertaken in the 1960's and 1970's overran construction time and cost by more than 50%. Buildings such as the Sydney Opera House exceeded time and cost assurances by the architects by 100's of %.

This situation created an opportunity for the better managed construction companies to re-engineer the facility procurement process. The "Design and Construct (D&C) methodology emerged in the mid 1960's in Australia.

Under this procurement model, the owner contracts directly with the builder for the design and construction of the building or facility. In order to get competition into the process, the owner calls for D&C tenders. The D&C tenderers usually each have their own design consultants who submit concept designs as part of the tender process.

Once awarded under a D&C contract, the builder is responsible for meeting the client's needs and staying within the contract sum. There are no variations for poor or inadequate documents, for missed items the client had called for, or for delays in construction for wet weather or any other reason.

In order to co-ordinate the design process, the builder usually employs his own "design manager". This person is usually an architect or an engineer but increasingly has "management qualifications" as his/her prime qualifications for the job.

The design manager feeds into the process "buildability issues" generally not understood by traditional architects and engineers. "Buildability issues" involve manufacturing and procurement aspects, repetition of details, waterproofing, crane and equipment capability, industrial issues (eg toxic fumes from particular paint coatings) and safety of construction issues.

In the late 1990's, the Build Own Operate (BOO) and Build Own Operate and Transfer (BOOT) methods of procurement emerged. This was in response the realisation by clients, especially government, that funding of projects needed to be part of the procurement equation. Contracting under this methodology became even more sophisticated and traditional architectural practice even more irrelevant.

To compete, architects would need to understand the intricacies of the international money markets as well as the intricacies of modern construction technology. "Swaps" and '10 year bond rates" are not and cannot be expected to part of the vocabulary of architects.

In the late 1990's, the Blair Government in the UK evolved the BOO/BOOT system even further - to the Private Finance Initiative (PFI) method. This has been paralleled in Australia in many ways by the development of similar arrangements by Thiess Contractors with private clients such as BHP.

Under PFI contracts even more innovative ways of procuring "services" as opposed to "facilities" is taking place. By way of example, the RAF has traditionally owned its own fleet of training aircraft/helicopters, employed its own instructors and executed its own training programme. Under the PFI process, the RAF called for the provision of a defined number of helicopter training hours per month. The successful contractor owns the helicopters, employs the instructors and provides the service to the RAF on an agreed programme. When not needed for training, the helicopters and their instructor/pilots are available for commercial work. RAF helicopters would traditionally be idle when not in use for training. As a result, the cost per training hour to the RAF has dropped dramatically.

Thiess in Australia has, as one of its stated intentions - "to be a one stop shop for infrastructure and services" to its private and public clients. Thiess has also described its emerging business for the 21st century as being a "Total Environment Industry" (TEI) in which Thiess will provide for its clients a holistic approach giving "Quality Working Environments" as opposed to square metres of floor space. The "Quality Working Environment" may or may not involve a building.

For another key client (an airline), Thiess has suggested that the company should not want to own or operate its own terminals. Thiess could well find a passive owner and manage and maintain most if not all of the terminal - a building worth some \$200M. The airline would then concentrate on the management of the \$1Bn worth of aircraft that are parked around or are approaching or leaving the terminal at any given time. In this way innovated "management based" construction companies are re-defining the construction industry. Architecture will remain an important part of the process, but the practice of architecture will be fundamentally different from what it is today.

Thiess spends a great deal of time and money in the "design management" process. For major projects we insist on all consultants - architects, mechanical, hydraulic, civil, electrical and communication engineers, financiers, building surveyors and quantity surveyors, working together in one office. This is the only way to get effective communication and integration of effort. This is fundamental to getting a cost effective outcome. Legislation that tends to keep professionals isolated from each other is counter productive.

### **Items for the productivity Commission to Consider**

- Most schools of architecture fail to provide graduates with the management skills they will need to survive in the real world.
- Many of the personality aspects of a person that may equip him or her to be a good designer may be fundamentally different to the characteristics necessary to manage a business.
- Restricting the ownership (and hence management) of an architectural practice to an architect or group of architects makes no more sense then restricting ownership of a chemist shop to a chemist or the ownership of a medical practice to a doctor. These restrictions are all merely attempts by each profession to preserve the status quo and to prevent competition. Provided the services in each case are provided by appropriately qualified professionally insured and registered practitioners, ownership of a practice or business is irrelevant. Ownership by people or organisations able to "manage" process is more likely to result in improved quality and efficiency.
- Restricting registration of architects on a state by state basis makes no sense. The Building Code of Australia (BCA) is Australia's only recognised building Code. All design and construction must meet this code together with the various SAA codes that may also apply. Registration should be Australia-wide.
- Is registration necessary? The only reason why any profession needs a registration process is to differentiate between the attainment of a professional qualification - eg BArch or MBBS and attainment of the "know how" and experience of applying the knowledge in practice. Providing the qualifying and registration processes are followed, the general members of the public can be reasonably assured that on balance they will receive professional services from registered builders, architects, doctors and solicitors. The system is not fool proof but is better than no system. Registration is part of a public quality assurance process - but not necessarily part of a quality management process.
- Can other than registered persons provide a competent service? Many of us visit the chiropractor for a sore back and are more than satisfied with the end result. On the other hand, if the back needed a laminectomy to prevent pain recurring, I am sure that we would want some assurance that the person performing the service was registered for that particular service - ie. an experienced and registered surgeon . When building a house, many people are perfectly happy with the service provided by a draftsman. Whether the end product has any architectural merit or not is independent of its ability to meet the BCA.

On the other hand, if the building in question was a 40 storey office block, one would want assurance that the person performing the work carried a very large professional indemnity insurance policy. I would expect that the insurance company would want some form of measure of competence - before it issued cover. Registration would be a good start.

Registration also carries with it the threat of de-registration for incompetent work or fraudulent behaviour. Services currently carried out by draftspersons is not subject to such sanction.

Registration may well be considered an option for professionally qualified architects who are happy to work for an architect or builder who ultimately bears responsibility for the persons performance.

My experience over the past 40 years includes lengthy periods working in a traditional architectural design office, the supervisory (on site) branch of a very large traditional A&E practice (the former Commonwealth Department of Works), CSIRO Buildings Branch, a State Government service provider, and for the last 13 years at senior management level of the largest construction group in Australia (Thiess).

Looking back on that experience suggests to me that registration of an architect for major building projects should be conditional on the person working for one of the major contractors for a period of at least two years. Having been exposed to the full range of construction experience, I can only say that the current architectural training and registration is woefully inadequate as a process to turn out competent and efficient professionals.

As a result, the traditional method of engaging an architectural consultants on a percentage fee basis, and having that architect become responsible for the design and procurement of a complex modern facility, is the least likely way to get a satisfactory and efficient outcome.

- Should anyone be able to use the term architects in relation to the provision of services to the building industry? It all comes back to the matter of quality assurance - the general public have a right to be assured that people who purport to be medical practitioners, engineers, architects, pharmacists or nuclear scientists are what they say they are. On the golf course, people can call themselves whatever they like, but on the shingle outside an office, there should be no room for misinformation.
- How can efficiency be improved through architectural practice? The development of A&E (Architects and Engineers) practices as happens in the USA would be a good start. As noted above, D&C contractors insist on all consultants being co-located. Multi discipline "Building Service Practices" would be one way of increasing efficiency. It may also help architects to stay in business. The present form of practice is not viable.
- Should Registration be linked to size of project? Building registration relates to size of project. Companies can be registered as house builders or non-restricted builders. Classifications vary from State to State.

The registration of architects for house/residential 2 storey only categories may encourage the development of residential practices as opposed to general practices. Australian residential design is very poor by European standards where the use of an architect is compulsory. Compulsory use of general architects would be resisted by house builders - however compulsory use of a registered "housing architect" may be a different matter. This matter deserves further consideration. As suggested above for major building registration - registered house architects

would need to work with a registered house builder for at least one year as part of the registration process.

## **CONCLUSION**

The current system of training, registration and practice for architects needs to be overhauled. The system currently does not produce an end product capable of performing the service demanded by society.

New models of facility procurement such as BOO, BOOT and PFI make traditional architectural practice irrelevant. There will be increasing engagement of architects by the major construction companies.

The architectural quality of residential housing in Australia is poor by European standards - mostly by the lack of architects practicing in this area - and because there is no compulsion to use an architect. The challenge is to devise a system that encourages lower cost residential architectural practices without the element of compulsion.

Architectural schools at universities need to be overhauled to give graduates a better understanding of management - for their own survival in the real world. However, that said, there is no reason why architectural practices should be owned or managed by architects.

Future architectural practice will be very much dependent on where the major construction companies take the business. Companies such as Thiess are building facilities today at lower rates per unit of measure, than they were 10 years ago, despite escalating and labour costs. The reduction in unit cost is the result of dramatic increases in productivity. Architects used by Thiess have adapted to the change and contribute to the increased productivity through the adoption of new technology. Other practices just wonder where the business went!

After several thousand years of the evolution of the construction industry we have returned to where we started. The grand visionary, the architect of the procurement of major infrastructure, is once again the "master builder". It is the Lend Leases, the Leightons, the Transfields and the Thiess' of the world who are pro-actively identifying the opportunities in society that need addressing. They have the balance sheet strength to underwrite major infrastructure, the technical skills to design and build efficient facilities and the managerial skills to find the resources and skills to make it happen.

The "high end" construction companies use modern technology and management skills to develop very efficient and cost effective (by world standards) infrastructure. They do this in order to secure sustainable profit margins.

The "low end" construction companies are locked into the traditional reactive procurement models typified by high capital cost, inefficient process and low profit margins. Traditional architectural practices depend on this market where they survive on the margins of inefficiency".

The Productivity Commission has a real opportunity to play a major part in the redefinition of architectural practice. However in reviewing architectural practice, it has to examine the setting in which modern architectural practice takes place - the procurement of contemporary infrastructure for a modern society. Traditional architectural practice is irrelevant to this new setting.

**William C Curnow, BArch ARAIA**