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PROCUREMENT
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CONTENTS

SU ALLIN:

"REGISTRATION OF CONTRACTS"

DAVID J. BLACKWOOD & S. SARKAR & A.D. PRICE:

"FACTORS AFFECTING THE PROCUREMENT OF CAPITAL WORKS FOR THE UNITED KINGDOM WATER INDUSTRY"

DAVID J. CARTER:

"THE USE OF THE CONCEPT OF ACTIVITY PROFILES IN CONTRACTUAL SYSTEMS"

DAVID W. CHEETHAM & DAVID JAGGAR:

"PROCUREMENT SYSTEMS - WHICH WAY FORWARD?"

ZORAN DIMKIC:

"SOME ASPECTS OF YUGOSLAV CONTRACTUAL ARRANGEMENTS & COMPARISON WITH INTERNATIONAL PRACTICE IN CONSTRUCT. INDUSTRY"

CHONG SUN MING:

"IMPACT OF PROCUREMENT SYSTEMS ON DEVELOPMENT OF THE CONSTRUCTION INDUSTRY IN SINGAPORE & MALAYSIA"

RODNEY A. EASTHAM:

"THE DECISION TO TENDER WITHIN CURRENT CONTRACTUAL ARRANGEMENTS"

PETER FENN:

"SETTLING DISPUTES ON CONSTRUCTION PROJECTS"

BRIAN GREENHALGH:

"A GENERAL CLASSIFICATION FOR THE PROCUREMENT OF CONSTRUCTION USING THE BASIS OF FUNCTIONS & RESPONSIBILITIES & INVESTIGATING WHETHER THIS CAN FORM THE BASIS OF A SINGLE FORM OF CONTRACT"

NICHOLAS HAMILTON:

"A REVIEW OF UNITED KINGDOM PROJECT PROCUREMENT METHODS"

WILLIAM HUGHES:

"DESIGNING FLEXIBLE PROCUREMENT SYSTEMS"

V.A. KLIMOV & V.M. DIDKOVSKI & Y.A. REKITAR:

"CONTRACTS AND TENDERS IN CONSTRUCTION IN THE USSR" (STATUS AND DEVELOPMENT PROSPECTS)

SHAMIL G. NAOUM:

"MANAGEMENT CONTRACTING - REVIEW AND ANALYSIS"

M. PAUL NICHOLSON:

"A COMPARATIVE STUDY OF THE PROCUREMENT METHODS FOR DESIGN WORK, WITH PARTICULAR REFERENCE TO THE 'DESIGN & BUILD' CONTRACTS"

VLADIMIR SKENDROVIC & PETER DUKAN:
"CONTRACTING IN YUGOSLAVIA"

SURINDER SINGH:
"A RATIONAL PROCEDURE FOR THE SELECTION OF APPROPRIATE
PROCUREMENT SYSTEM"

SVETLANA VUKOVIC & ATILA HORVAT:
"CONTRACTUAL ARRANGEMENTS FOR RESIDENCES BUILT
FOR THE FREE HOUSING MARKET IN VOJVODINA"

ADRIAN WOOD:
"THE STANDARD PROCUREMENT PROCEDURE FOR BUILDING WORKS
IN THE U.K. AND THE RELATIONSHIP BETWEEN BILLS OF QUANTITIES
AND THE FORM OF CONTRACTS"

ERNESTO E. HENRIOD:
"AN OVERVIEW OF PROCUREMENT PROCEDURES IN PROJECTS
FINANCED BY THE WORLD BANK"

CLAUDE MATHURIN:
"L'HARMONISATION DU DROIT DE LA CONSTRUCTION DANS L'ESPACE
COMMUNAUTAIRE"

SMILJAN SIMAC:
"FIDIC CONTRACT DOCUMENTS"



International Council for Building Research Studies and Documentation

**WORKING COMMISSION W92
PROCUREMENT
SYSTEMS**

**"REGISTRATION OF
CONTRACTORS"**

**SYMPOSIUM
10. - 13. SEPTEMBER 1990
ZAGREB
YUGOSLAVIA**

DR SU ALLIN

CONSTRUCTION INDUSTRY BOARD



GRAĐEVINSKI INSTITUT

REGISTRATION OF CONTRACTORS

1 INTRODUCTION

1.1 Historical Perspective

In the early 1980's, various government departments and statutory boards in Singapore maintained their own procurement systems. Each major government agency registered their own contractors and invite them to tender. The contractors would need to register with each of these agencies. The registration requirements varied from one agency to another. Information on the performance of contractors were not shared among the agencies.

1.2 Need For Central Registration System

In 1984, the Singapore Construction Industry Development Board (CIDB) was formed under the Ministry of National Development. CIDB is the agency responsible for the upgrading, promoting and raising the efficiency and quality of the construction industry in Singapore. It was considered essential to develop a central registration system for the public sector to simplify the registration process for all government agencies and provide one-stop service to all contractors. The performance of all contractors could be monitored centrally and the information shared by all agencies for tender evaluation purposes.

1.3 Merging Of The Independent Registration Systems

It was decided in 1984 to proceed with the merging of the various independent registration systems of the major government agencies. The following agencies joined the central registration system in stages:

| <i>Date</i> | <i>Government Agency</i> | <i>Major Projects/Activities</i> |
|-------------|-------------------------------|---|
| Aug 1984 | Public Works Department | Roads, airports hospitals, schools & universities |
| | Ministry of the Environment | Sewerage, drainage waste disposal |
| Dec 1984 | Jurong Town Corporation | Factories and industrial infrastructure |
| Apr 1985 | Public Utilities Board | Electricity, water, gas |
| | Port of Singapore Authority | Port facilities & services |
| | Urban Redevelopment Authority | Master plan, land sale, car parks, commercial redevelopment |
| Apr 1987 | Singapore Telecom | Telecommunications |
| Jul 1987 | Housing and Development Board | Housing for about 85% of population |
| Jan 1988 | All government agencies | |

2 PUBLIC SECTOR PROCUREMENT USING THE CONTRACTORS REGISTRATION SYSTEM

2.1 Since 1988, all Government departments and statutory boards are required to use the central contractors registration system to invite tenders. There are several advantages of a central registration system:

a) Simplified procurement process for public sector agencies

The agencies could concentrate mainly on procurement activities without having to pre-qualify contractors for each tender.

b) One-stop service for all contractors

The contractors would only need to apply for registration once to be eligible to participate in all public sector tenders. It would no longer be necessary for them to register with each agency separately.

c) Central monitoring of performance of contractors

The performance of all contractors would be assessed based on the same set of criteria and the information could be centrally monitored and shared among all government agencies.

d) Development of the construction industry

Central registration would also allow specific measures to improve the construction industry in the desired direction. One such area is in raising the professionalism of the construction firms.

2.2 The central contractors registration system was therefore set up and administered by CIDB to achieve the objectives:

a) Support public sector procurement by registering contractors for the entire public sector.
(There are a total of about 300 departments and statutory boards in the public sector)

b) Serve as the accreditation body for contractors.
(There are a total about 2600 registered contractors which are graded according to their capabilities)

c) Upgrade the level of professionalism in the construction industry.
(More construction firms now employ more qualified professional and technical personnel)

2.3 It should be noted that the central registration system is not a licensing system but an accreditation system for contractors. Contractors who are not registered are not precluded from doing business in Singapore. Non-registered contractors are not eligible to tender for public sector projects only. They could still tender for private sector projects. In recent years there is a trend among many private sector clients to take reference from the CIDB contractors registration system since it is the only major accreditation system for contractors in Singapore. Many of these clients would either invite registered contractors to participate directly in tenders (as in the case of the public sector) or pre-qualify them from a list of registered contractors.

3 THE CIDB CONTRACTORS REGISTRATION SYSTEM

3.1 Structure Of The Registration System

The registration system is based on the following structure:

a) Registration Heads

There are 51 registration heads and each head represents a specific scope of work which the contractor is capable of executing in public sector contracts. For example, a contractor may be registered in the building head and be eligible to participate in building tenders. A contractor may be registered in one or more heads.

These 51 heads are grouped into five main categories:

- (i) Construction Work heads
- (ii) Construction Related heads
- (iii) Mechanical and Electrical heads
- (iv) Maintenance Work heads
- (v) Supply heads

b) Financial Grades

There are 8 financial grades for each registration head. The lowest grade is \$100,000 and the highest grade is unlimited (above \$ 30 million). Each financial grade represents the tender value which the contractor is capable of executing. For example, a contractor registered in building head and financial grade of \$ 1 million would be eligible to tender for public sector tenders in building up to \$ 1 million. Contractors registered in higher grades are eligible to participate in lower valued tenders.

3.2 Registration Requirements

A contractor seeking registration would generally need to meet the following registration requirements:

a) Financial Resources

The contractor is required to have a paid up capital and net capital worth of generally 10% of the financial grade (see Annex A). For example, a contractor registered in building \$ 1 million grade is required to have a paid up capital of \$ 100,000.

b) Track Record

The contractor is required to have completed relevant projects over the past 3 years and the aggregate total of these project values should be at least equal to the financial grade applied for (see Annex A). For example, a contractor registered in building \$ 1 million grade is required to have completed \$ 1 million worth of building projects over the past 3 years. For supply heads, the track record requirement is half the value of the financial grade. The contractor's performance in these projects assessed by their clients are required to be satisfactory.

c) Personnel Resources

The contractor is required to employ full-time qualified professional or technical personnel who have a degree or diploma in engineering or equivalent (see Annex B). For example, a contractor registered in building \$ 1 million grade is required to employ two full-time staff with diploma qualification in civil engineering, building or equivalent. This requirement is waived for certain non-technical heads and most of the supply heads.

3.3 Concessionary Entry For New Firms

To ensure that new entrants into the industry could enter the registration system and inject competition in public sector tenders, concessionary rules are applicable to these firms. For example, if a building contractor has employed a full-time qualified professional or technical personnel with at least 3 years of experience but does not have any track record, it could enter the registration system at the lowest grade of \$ 100,000. It could then secure some projects and thereafter apply for upgrading to a higher financial grade.

4 FEEDBACK AND CONTROL

There are a total of about 2600 firms registered with CIDB under the various registration heads and financial grades (see Annex C). The registration system has incorporated the following measures to provide the necessary feedback and control:

4.1 Renewal, Upgrading and Downgrading

The registered contractor is required to renew its registration status annually. Its resources would be checked to ensure that it still possesses the capability to execute the type and size of tender corresponding to its registration. A contractor who does not meet the requirements may be downgraded, for example, if it is financially poor or it no longer employs any qualified professional or technical personnel.

A contractor could apply for upgrading to a higher financial grade as soon as he meets the requirements for the higher grade of registration. Performance assessment by clients are usually sought in order to evaluate the upgrading applications. A contractor whose performance is persistently poor cannot be upgraded.

4.2 Performance Assessment System

A performance assessment system for contractors was developed for the public sector. All agencies would assess the contractors' performance in the following areas:

- (i) Quality of material and equipment
- (ii) Quality of workmanship
- (iii) Site planning and control
- (iv) Response to instructions
- (v) Public inconvenience
- (vi) Progress of works
- (vii) Safety

All government agencies are required to submit the performance assessment report within one month after the practical completion of the contract. Performance during the defects liability period would also be assessed. Performance reports are entered into a computerised databank maintained by CIDB. Government agencies could request on information on any shortlisted contractor for tender evaluation purposes.

The public sector performance assessment report includes a merit and default points system to give merit points to a contractor who performs well, and default points to a contractor whose performance is poor. Each factor would be assessed and merit/default points given accordingly. The government agency would give warnings to the contractor before giving any default points. Merit points of a contractor in various projects would offset its default points. Contractors who have been given any default points would be informed so that they could improve their performance in other projects to avoid being debarred.

4.3 Debarment Of Contractors

The public sector procurement system has incorporated a mechanism to debar a contractor, that is to remove a contractor's eligibility to participate in tenders, if its performance is very poor. A contractor who accumulates 10 or more default points in any 12 month period would be debarred from tendering in the public sector for one year and would be de-registered accordingly. Debarment matters are decided by a committee chaired by the Ministry of Finance which is overall responsible for procurement in the public sector.

A contractor could also be debarred if it commits the following offence:

- (i) Abandonment of contract by contractor
- (ii) Termination of contract by client
- (iii) Withdrawal of tender by contractor
- (iv) Use of sub-standard materials and short supply
- (v) Giving false information
- (vi) Corruption

5 TENDERING PROCEDURES

All government agencies using the CIDB contractors registration system to invite their tenders would generally adopt the following procedures:

5.1 Determining The Tender Size And Scope Of Work

The agency would first estimate the tender value. Based on the registration system, it would stipulate the relevant registration head corresponding to the scope of work, and a financial grade corresponding to the tender value.

5.2 Checking On The Likely Competition

The agency would then check the likely level of competition based on the number of registered contractors. If there is sufficient competition, the tender would stipulate the financial grade corresponding to the tender value. If however, there are insufficient contractors registered, a lower financial grade could be stipulated to increase the level of competition. Each public sector tender normally requires at least three bids to ensure sufficient competition.

5.3 Tender Notices

Tender notice would then be advertised in the local press and placed in the government gazette. Most of the tender advertisements would appear on Friday to make it easier for contractors to select and bid for relevant tenders. The tender notice would stipulate the registration head and financial grade of contractors invited to tender. For example, the tender notice could invite building contractors registered in the \$ 10 million grade to construct a \$ 10 million office building.

5.4 Checking The Validity Of Contractor's Registration Status

The contractors holding the relevant registration certificate would then collect the tender documents at the agency's contract department. The agency's officer would check the certificate to ensure that the contractor is registered in the correct head and financial grades and to ensure that the certificate has not expired before giving the tender document to the contractor.

5.5 Tender Closing And Evaluation

Tender period is normally three weeks but could vary with the tender size and complexity. When tender closes, the agency would do a quick check on all the bids and list the names of the contractors and their tender prices. This information is then published at the agency's premises to let all the participating contractors know each others' tender prices. The same information would also be published in the government gazette. The agency would then proceed to evaluate the details of each tender to ensure compliance with tender requirements.

5.6 Final Check On The Contractor

The agency would shortlist the contractor and recommend to the tender committee for award of tender. In most tenders, the lowest priced tender would be successful unless there are special reasons for awarding the tender to the second or third lowest priced contractor. At this point, the agency would do a final check by requesting for the contractor's information from CIDB. This computerised information would include details such as the latest registration status, registration expiry date, company directors, list of completed and current projects, and paid up capital. This information would assist the agency in tender evaluation.

5.7 Feedback Control On Performance

After awarding the tender to the contractor, the agency's officers would supervise the works on site. If the performance of the contractor in any of the factors of assessment is not satisfactory, the officer would warn the contractor and advise him to improve. If at the end of the contract, the contractor's performance is still poor, default points could be given in the performance assessment report. If the contractor's performance is excellent, merit points could be given.

6 CONCLUSION

The contractors registration system is now an integral part of public sector procurement . The system has streamlined and simplified the procurement procedure, ensured a minimum standard for contractors executing public sector projects, upgraded the professionalism of the construction firms, and served as the accreditation system for all contractors in Singapore.

**FINANCIAL RESOURCES AND TRACK RECORD REQUIREMENT
FOR CONTRACTORS REGISTRATION**

| Grade | Financial Limit | Paid up Capital | Track Record |
|--------------|---------------------------------|------------------------|---------------------|
| G1 | \$100,000 | \$10,000 | \$100,000 |
| G2 | \$500,000 | \$50,000 | \$500,000 |
| G3 | \$1 Million | \$100,000 | \$1 Million |
| G4 | \$3 Million | \$300,000 | \$3 Million |
| G5 | \$5 Million | \$500,000 | \$5 Million |
| G6 | \$10 Million | \$1 Million | \$10 Million |
| G7 | \$30 Million | \$3 Million | \$30 Million |
| G8 | Unlimited Above \$30 Million | \$5 Million | \$50 Million |

**PERSONNEL RESOURCES REQUIREMENT
FOR CONTRACTORS REGISTRATION**

| Grade | Financial Limit | Personnel Resources | Experience |
|--------------|---------------------------------|--|--------------------|
| G1 | \$100,000 | 1 Diploma holder | 3 years experience |
| G2 | \$500,000 | 1 Diploma holder | |
| G3 | \$1 Million | 2 Diploma holders | |
| G4 | \$3 Million | 2 Diploma holders | |
| G5 | \$5 Million | 2 Diploma holders | |
| G6 | \$10 Million | 2 Diploma holders Or 1 Degree holder | |
| G7 | \$30 Million | 2 Degree holders | |
| G8 | Unlimited Above \$30 Million | 4 Degree holders | |

**NUMBER OF FIRMS REGISTERED IN EACH REGISTRATION HEAD
& FINANCIAL GRADE AS AT 30 JUNE 1990**

| REGISTRATION HEAD | FINANCIAL GRADE | | | | | | | | Total |
|-------------------|-----------------|----|----|----|----|----|----|----|-------|
| | G1 | G2 | G3 | G4 | G5 | G6 | G7 | G8 | |

CONSTRUCTION WORK HEADS

| | | | | | | | | | | |
|------|------------------------|-----|-----|-----|----|----|----|----|----|-----|
| CW01 | General Building | 164 | 121 | 106 | 64 | 51 | 59 | 49 | 35 | 649 |
| CW02 | Civil Engineering | 139 | 106 | 91 | 75 | 32 | 31 | 30 | 32 | 536 |
| CW03 | Dredging & Reclamation | 3 | 6 | 3 | 2 | 11 | 6 | 12 | 5 | 48 |
| CW05 | Marine Structures | 13 | 12 | 7 | 3 | 12 | 15 | 6 | 6 | 74 |
| CW06 | Piling | 3 | 5 | 7 | 8 | 9 | 6 | 13 | 7 | 58 |

CONSTRUCTION RELATED HEADS

| | | | | | | | | | | |
|------|---|----|----|----|----|---|---|---|--|-----|
| CR01 | Cable Installation & Road Reinstatement | 10 | 9 | 11 | 12 | 1 | | | | 43 |
| CR02 | Corrosion Protection | 22 | 12 | 7 | 3 | | 1 | | | 45 |
| CR03 | Demolition | | | | | | | | | 91 |
| CR04 | Fencing & Ironworks | 42 | 11 | 6 | | | | | | 59 |
| CR05 | Concrete Repairs | 24 | 11 | 9 | 3 | 1 | | 1 | | 49 |
| CR06 | Interior Decoration | 62 | 30 | 23 | 7 | 4 | 2 | | | 128 |
| CR07 | Pipe Laying & Road Reinstatement | 26 | 10 | 10 | 13 | 4 | | | | 63 |
| CR08 | Pole Installation | 11 | 6 | 3 | | | | | | 20 |
| CR09 | Repairs & Redecoration | 79 | 26 | 22 | 10 | 4 | 4 | | | 145 |
| CR10 | Roofing Installation | 2 | 1 | 6 | 4 | 2 | | | | 15 |
| CR11 | Signcraft Installation | 41 | 14 | 1 | 1 | 1 | | | | 58 |
| CR12 | Soil Investigation & Stabilisation | 8 | 2 | 9 | 3 | 2 | 2 | | | 26 |
| CR13 | Waterproofing | 37 | 16 | 7 | 5 | 2 | | | | 67 |
| CR14 | Road Marking | 2 | 1 | 4 | 2 | | | | | 9 |
| CR15 | Asphalt Works | 1 | | | 1 | 4 | 1 | | | 7 |

MECHANICAL & ELECTRICAL HEADS

| | | | | | | | | | | |
|------|--|----|----|----|----|----|----|---|---|-----|
| ME01 | Airconditioning, Refrigeration & Ventilation Works | 70 | 33 | 34 | 14 | 10 | 6 | 2 | | 169 |
| ME02 | Building Automation Industrial & Process Control Systems | 47 | 19 | 21 | 12 | 12 | 2 | | | 113 |
| ME03 | CATV | 4 | 5 | 6 | 2 | 1 | | | | 18 |
| ME04 | Communication & Security Systems | 37 | 23 | 23 | 9 | 6 | 3 | 3 | | 104 |
| ME05 | Electrical Engineering | 75 | 64 | 38 | 25 | 26 | 8 | 2 | 1 | 239 |
| ME06 | Fire Prevention & Protection Systems | 50 | 18 | 17 | 9 | 5 | 2 | | | 101 |
| ME07 | High & Low Tension Overhead Line Installation | 6 | 7 | | | | | | | 13 |
| ME08 | Internal Telephone Wiring For Telecommunications | 32 | 7 | 1 | 1 | | | | | 41 |
| ME09 | Lift & Escalator Installation | 4 | 3 | | 3 | 7 | 1 | 3 | | 21 |
| ME10 | Line Plant Cabling/Wiring for Telecommunications | 16 | 2 | 1 | 3 | | | | | 22 |
| ME11 | Mechanical Engineering | 86 | 74 | 39 | 25 | 18 | 12 | 8 | 3 | 265 |
| ME12 | Plumbing & Sanitary Works | 22 | 27 | 27 | 9 | 11 | 1 | | | 97 |
| ME13 | Traffic Light Systems | 2 | 3 | 1 | 1 | 1 | 1 | | | 9 |
| ME14 | Underground Pipeline for Telecommunications | 24 | 7 | 9 | 7 | | | | | 47 |

**NUMBER OF FIRMS REGISTERED IN EACH REGISTRATION HEAD
& FINANCIAL GRADE AS AT 30 JUNE 1990**

| REGISTRATION HEAD | FINANCIAL GRADE | | | | | | | | Total |
|-------------------|-----------------|----|----|----|----|----|----|----|-------|
| | G1 | G2 | G3 | G4 | G5 | G6 | G7 | G8 | |

MAINTENANCE WORK HEADS

| | | | | | | | | | | |
|------|---|-----|----|----|----|---|--|--|--|-----|
| MW02 | Housekeeping, Cleansing, Desilting, & Conservancy Service | 144 | 35 | 54 | 9 | 2 | | | | 244 |
| MW03 | Landscaping | 39 | 15 | 22 | 11 | 4 | | | | 91 |
| MW04 | Pest Control | 22 | 2 | | | | | | | 24 |

SUPPLY HEADS

| | | | | | | | | | | |
|------|--|-----|-----|----|----|----|----|----|----|-----|
| SY01 | Basic Building Materials | 18 | 10 | 13 | 7 | 12 | 8 | 4 | 2 | 74 |
| SY02 | Chemicals | 44 | 34 | 23 | 9 | 5 | 3 | 4 | | 122 |
| SY03 | Doors, Windows, Louvres, glazing | 27 | 11 | 9 | 6 | 2 | 5 | | | 60 |
| SY04 | Electrical Equipment | 10 | 13 | 8 | 3 | 5 | 4 | 3 | 4 | 50 |
| SY05 | Electrical & Electronic Materials, Products & Components | 141 | 92 | 88 | 24 | 34 | 13 | 18 | 18 | 428 |
| SY06 | Finishing & Building Products | 45 | 29 | 39 | 14 | 11 | 6 | | 1 | 145 |
| SY07 | Gases | 5 | 3 | | | 1 | 2 | | | 11 |
| SY08 | Mechanical Equipment, Plant & Machinery | 102 | 113 | 86 | 34 | 36 | 20 | 11 | 5 | 407 |
| SY09 | Mechanical Materials, Products & Components | 105 | 44 | 61 | 15 | 8 | 1 | | 3 | 237 |
| SY10 | Metal & Timber Structures | 23 | 22 | 25 | 8 | 7 | 6 | 2 | 1 | 94 |
| SY11 | Petroleum Products | 11 | 6 | 7 | 1 | | 1 | 4 | 4 | 34 |
| SY12 | Pipes | 17 | 12 | 18 | 4 | 10 | 4 | 1 | 1 | 67 |
| SY13 | Precast Concrete Products | 1 | 4 | 2 | 4 | 5 | 4 | 3 | | 23 |
| SY14 | Sanitary Products | 20 | 16 | 8 | 4 | 7 | | | | 55 |

Financial Grades

| | |
|----|------------------------------|
| G1 | \$100,000 |
| G2 | \$500,000 |
| G3 | \$1,000,000 |
| G4 | \$3,000,000 |
| G5 | \$5,000,000 |
| G6 | \$10,000,000 |
| G7 | \$30,000,000 |
| G8 | Above \$30,000,000 Unlimited |



International Council for Building Research Studies and Documentation

**WORKING COMMISSION W92
PROCUREMENT
SYSTEMS**

**SYMPOSIUM
10. - 13. SEPTEMBER 1990
ZAGREB
YUGOSLAVIA**

**"FACTORS AFFECTING THE
PROCUREMENT OF CAPITAL
WORKS FOR THE UNITED KINGDOM
WATER INDUSTRY"**

**D.J.BLACKWOOD (SARKAR & PRICE)
DUNDEE INSTITUTE OF TECHNOLOGY**



GRAĐEVINSKI INSTITUT

FACTORS AFFECTING THE PROCUREMENT OF CAPITAL WORKS FOR THE UK WATER INDUSTRY

INTRODUCTION

The structure of the UK water industry.

In England and Wales the responsibility for the provision and maintenance of water supply and sewerage facilities was transferred to the private sector with the sale (privatisation) of the government owned Regional Water Authorities to create nine English and one Welsh public limited companies (plc's). Prior to privatisation, the Regional Water Authorities held an agreement whereby the various English Local Authorities were responsible as agents to the Water Authorities for the provision and maintenance of sewerage facilities within their districts. These agency agreements were transferred to the plc's but these could be subject to far reaching review in the future. There are also 28 existing small private water supply companies with no involvement in sewerage matters.

In Scotland the provision and maintenance of water supply and drainage facilities rests with the 12 Scottish Regional Local Authorities who operate Departments of Water Services. In Northern Ireland the responsibility rests with UK Central Governments' Department of Environment for Northern Ireland.

Water industry capital works budgets.

It has long been recognised that there is a need for increased investment in the water and sewerage infrastructure in the UK. Existing or impending European Commission legislation will significantly increase the annual rate of this investment with the most significant being:

- (i) the pollution of bathing water directive;
- (ii) Directives concerning the pollution of rivers and estuaries by "red list" substances;
- (iii) the drinking water quality directive.

The EC are enforcing legislation and the UK have been prosecuted for non-compliance with the timescale for improvements under (i) and (iii) above. The water companies have responded with significant increases in their projected capital budgets. Evidence of this response exists in the annual financial reports of five of the ten new water companies which were published recently as summarised in Table 1.

| Water Company | Annual Capital Budget (Pounds) | |
|---------------|--------------------------------|------------------------|
| | Current | Future |
| Anglia | 192M | 400M per annum by 1995 |
| Thames | 240M | 400M per annum |
| South West | 52M | 117M per annum |
| North West | 264M | 400M per annum by 1992 |
| Wessex | 95M | 95M per annum |

Table 1 Water Company Capital Budgets

The general situation is one of a need for rapidly increasing capital expenditure and this will have a significant effect on the procurement systems adopted by the water industry client bodies.

Procurement options available to the water industry client bodies.

The majority of Water Engineering projects have been developed using the "traditional" procurement system shown in Figure 1.

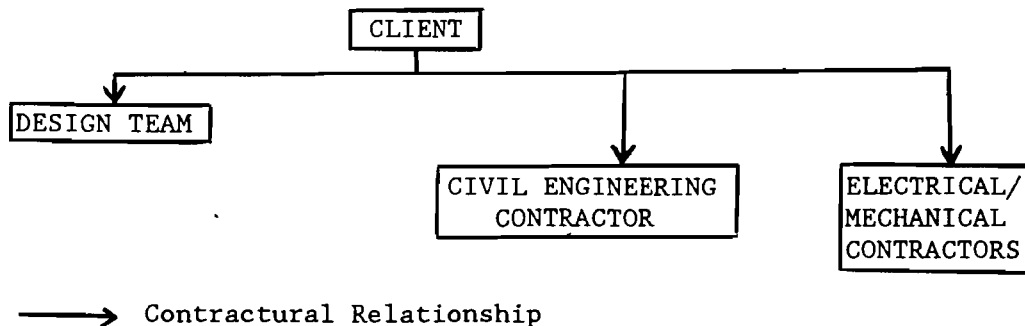


Figure 1 - Traditional Procurement System

The design team would be responsible for the conceptual and detailed design of the project, the preparation of contract documents and the issue of tender documents, and the supervision of the contractors involved in the construction of the works. The construction work would be let to contractors on the basis of competitive tenders from a preselected list of contractors using a contract based on the Conditions of Contract for Works of Engineering Construction, 5th edition (the ICE Conditions of contract). Since most water engineering projects would involve elements of mechanical and electrical control equipment separate contracts for these elements would be let, generally on the basis of design, installation and commission contracts. The design team would consist of either; the nomination of a direct employee of the water company or local authority as Engineer for the works assisted by a team of direct employees, this arrangement being commonly referred to as "in-house" design, or the appointment of an independent firm of consulting engineers. In the latter case the client bodies, because of their level of engineering expertise would have a member of their engineering staff acting in a capacity similar to that of a project manager.

Management Contracting and Construction Management arrangements would not generally be considered although design and construct schemes would be considered for projects that were largely process based.

This preference for traditional procurement systems with contractor selection based on competitive tender has been due in part to the need for public accountability when the water authorities were public bodies. Since privatisation this factor may not be as significant to the English and Welsh water companies and the balance between use of the various procurement systems is likely to change.

The future selection of procurement systems will therefore be more dependent upon the basic objectives of the water industry clients than on external influences.

CLIENTS OBJECTIVES.

Regardless of the nature of the client organisation, the principal aim in selecting project procurement methods is to obtain a finished project which will:

- be completed in the requisite timescale;
- perform to a satisfactory level;
- ensure that the most cost effective solution, on a life-cycle basis, is developed;
- ensure that the most appropriate allocation of risk between the various parties is achieved.

Project timescales

The major factor affecting the capital budgets of the water companies is the impact of EC legislation on pollution and water quality. The privatisation of the water companies, whilst not affecting the need for capital investment, has placed the water companies in a position where they are more able to raise sufficient finance to adequately fund this investment. The water companies, under the 1989 Water Act, are permitted to raise prices above the level of inflation to fund necessary increases in capital expenditure. The nett effect will be a rapid increase in capital expenditure with a corresponding increase in the necessary design work associated with this expenditure.

It is unlikely that the client bodies will be able to increase their in house design capacity to meet this demand. Whilst the water companies and local authorities have the expertise and the staff to design these projects in-house they will be unable to deal with the increased design work without widespread recruitment of suitably qualified additional staff. This recruitment would have to be initiated well in advance of the required completion dates of the projects. There is however no evidence of a recruitment campaign by any of these bodies.

The local authorities are further constrained by having a fixed number of posts available in their staff establishments and therefore recruitment of design staff at short notice is difficult. Consequently large projects with a relatively short period between initial conception and final completion will tend to involve private sector design organisations, either directly as design consultants or indirectly through design and construct contracts. In addition, they are unable to respond quickly to private sector changes in salary levels during a period where the demand for engineers at all levels exceeds the available supply and are therefore experiencing increasing difficulty in the recruitment and retention suitably qualified staff to their existing establishments. This imbalance between supply and demand will intensify, particularly in public health engineering, as increases in expenditure resulting from recent EEC directives coincide with a fall in the number of engineering graduates.

The use of private organisations may be self-perpetuating since the increased requirements of the private sector for qualified staff may be met through a corresponding decrease in staffing levels in the local authorities, thereby further reducing their capacity for in-house design. In England and Wales the privatised water companies will be more able to complete for staff with the private sector. Nevertheless, the problem of availability of qualified staff will remain.

Project performance and cost.

The choice of procurement system can significantly effect the clients' degree of control of the detailed outcome of the finished project. This degree of control is likely to be maximised with a project designed in-house, and minimised with a design and construct package based on an end product specification.

There are a number of reasons why client bodies would wish to retain such a degree of control. Firstly, the operation of any new project would have to be compatible with the operation of the clients existing facilities. This may place constraints on the use of particular processes or on the choice of mechanical and electrical equipment. Secondly, they will possess significant local knowledge and may have recent experience of projects of a similar nature and this can lead to the development of design solutions which are more appropriate to a particular project.

Clients control can be effectively exercised through their input to the design process. Figure 2 shows a model of the design process proposed by French (1) which illustrates the stages at which this input could be made.

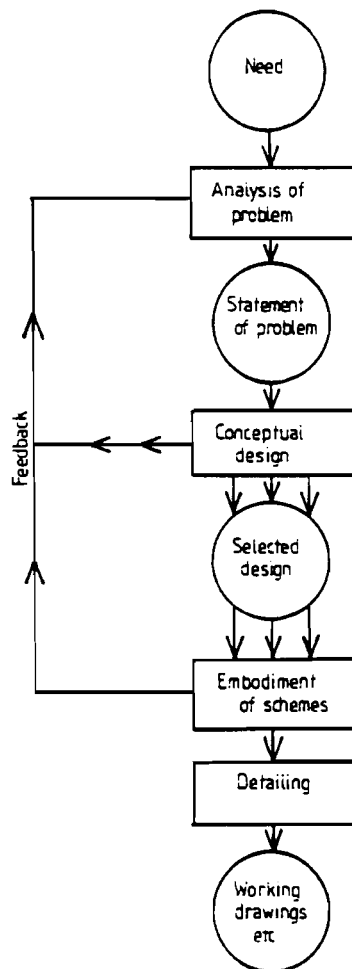


Figure 2. French's model of the design process.

At the very minimum the water industry client would be responsible for:
identifying the need;
analysing the problem; and
preparing a statement of the problem.

The statement of the problem is analogous with the preparation of a end product specification for a design and construct project or perhaps a brief for a consulting engineer. In either case the level of clients input will depend on the degree of detail in the specification or brief. At one extreme this could consist simply of the water or sewerage quality parameters required from the facilities and at the other extreme this could consist of a detailed specification of the clients preferred processes, plant, and facility layout requirements. In the latter case the client will have proceeded beyond the statement of the problem into the conceptual design, selection of design and embodiment of design stages. In fact it would perhaps be more accurate to describe a scheme developed in this way as a "detail and construct" scheme rather than a "design and construct" scheme with the design of the project being divided between the client and an external organisation.

It is conceivable that this would be the best way forward for water industry clients in reconciling their conflicting demands of;

- (a) desirable levels of control of the project;
- (b) the staffing levels required to adequately maintain that degree of control.

There are other external developments which may make a "detail and construct" option attractive to clients; namely the increase in fee competition amongst consulting engineers and a current interest in quality assurance in the design process.

The advent of fee competition, as described by Rowdon & Mansfield (2), will place consulting engineers involved in traditional projects under similar financial pressures to those involved in design and construct projects and there will be an increased need to accurately estimate and rigorously control the costs of design work. Referring to French's model of the design process the stages up to and including conceptual design would be the most difficult to estimate. However Ferry & Brandon (3) suggest that some 80% of the total costs of a project will have been committed by decisions made during this stage. It is therefore conceivable that the environment created for design in design and construct projects and in design work let to consultants on the basis of price may not lead to the most satisfactory conceptual designs. In view of the difficulties in estimating the costs of conceptual design work, it is possible that working to preset estimates of design costs at the conceptual stage is detrimental to both the quality and life-cycle costs of the completed project. It would however be possible to more accurately assess the costs of detailed design once the conceptual design has been developed.

It may be necessary for clients to require organisations on select lists of contractors for design and construct projects or consultants for design work to operate some form of design office Quality Assurance (QA) system in accordance with the British Standard BS 5750 or the International Standard ISO 9000. In this way both design and

construction cost estimates and the effectiveness of the organisations design management systems could be assessed at the selection stage. As is the case with cost estimates, QA procedures could be readily produced for detailed design but the intangible nature of conceptual design would limit the effectiveness of the QA system at the earlier stage of design.

Considering the potential conflicts between cost and quality and in view of the uncertain and complex nature of conceptual design work, it is likely that the most effective stage at which clients should invite external organisations would be on completion of the conceptual design. It could be argued that a major benefit of design and construct projects is that it removes the separation between designers and contractors which should lead to a more cost effective design and that this benefit may be lost if the flexibility of the turnkey designers is compromised. However, the conceptual design would only extend to elements of the project which are considered to be essential and therefore clients would be prepared to meet any additional costs of this nature.

Allocation of risk.

Client bodies, when considering the alternative procurement systems, must also consider carefully the choice of the most suitable standard form of contract to operate within the procurement system. The selected form of contract must ensure the most appropriate allocation of risk between the various parties. The Institution of Civil Engineers (ICE) Conditions of Contract for Works of Engineering Construction, 5th Edition has been utilised for most water engineering projects. The ICE conditions are generally intended for use on traditional contracts where the contractor would have no control of the design of a project and hence the risk is distributed generally on the basis that the contractor is responsible only for risks which could have been foreseen at the tender stage. The contractor is entitled to claim for additional costs associated with unforeseen circumstances under clause 12 of the conditions of contract. With design and construct projects the contractor would be able to consider at the design stage the effect of any changes in their design assumptions and it would be therefore reasonable to shift the balance of risk towards the contractors. This has been achieved in some contracts by the deletion in its entirety of clause 12 and risk allocation in this way would be broadly in line with the principle of allocating risk to the party best able to control that risk. This may lead to conservative design but most clients would accept this in return for greater certainty on the project completion costs. The shift of risk would also encourage design and construct contractors to give greater emphasis to quality and quality assurance of design work and this would reduce the potential problems associated with design work let by fee competition.

The applicability of the ICE conditions of contract may be further limited for process dominated projects which will be required as a result of the EEC directives. These conditions are concerned specifically with the construction of the process units rather than the adequacy of the performance of the actual process. Alternative forms of contract have been considered and Greenhalgh et al (4) suggest that the Model Form of Contract issued by the Institution of Chemical Engineers might be more appropriate. These conditions contain specific provision for testing that performance specifications have been met and contain remedies in the event of failure. If a modified ICE form of contract

were to be adopted then some form of performance bond may be required to safeguard against unsatisfactory performance of the completed works. The need for such a bond is questionable. In traditional procurement systems bonds are not required from consulting engineers designing the works nor is insurance against non-performance taken out on projects designed in house. The cost of any bond on any project would have to be passed to the client, who would have redress through the courts for non-compliance in any case. However some clients may consider that a bond would give a more certain and more readily attainable form of guarantee.

CONCLUSIONS

The advent of privatisation of the water industry in England and Wales will significantly affect the procurement systems adopted by the industry. The rapid increase in capital budgets and the reduction in the need for public accountability is likely to lead to a shift from the traditional procurement system to greater use of the design and construct system. Water industry clients will however require a high degree of control of the outcome of the projects and this can be best achieved by an adjustment to the design interface between clients and design and construct contractors. The necessary degree of control can be most effectively maintained by the direct involvement of the client in the design process up to and including the conceptual design of the project.

Having evolved the conceptual design the client would be able to issue definitive briefs to designers either through traditional procurement systems or more likely by a system which could be described as a "detail and construct" system. This system would be more compatible with current trends toward fee competition amongst designers and the implementation of formal quality assurance systems for the design process.

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International Council for Building Research Studies and Documentation

**WORKING COMMISSION W92
PROCUREMENT
SYSTEMS**

**SYMPOSIUM
10. - 13. SEPTEMBER 1990
ZAGREB
YUGOSLAVIA**

**"THE USE OF THE CONCEPT OF
ACTIVITY PROFILES IN
CONTRACTUAL SYSTEMS"**

**DR D. J. CARTER
UNIVERSITY OF LIVERPOOL**



GRAĐEVINSKI INSTITUT

THE USE OF THE CONCEPT OF ACTIVITY PROFILES IN CONTRACTUAL SYSTEMS.

INTRODUCTION

Problems concerned with a failure of the flow of information on large construction projects are sadly an all too common feature of the technical press. Such failures can lead to defective buildings, contract claims and wastage of resources. The monitoring procedures necessary to avoid these problems depend upon sufficient and timely information about construction activity. This has traditionally taken the form of correspondence, reports and records and its efficient use on implementation of contractual systems has been limited by the difficulty of retrieval of relevant information from the unstructured mass of contract or project information.

This paper outlines work to investigate management information systems within both designers and contractors organisations and presents the results of this work using systems analysis methods. It is argued that traditional systems methods are capable of representing formal links within and between organisations but that within construction organisations informal links may assume importance in the implementation of contractual arrangements. The development and use of the activity profile concept is described and their function within management information systems in design and contracting organisations described.

MANAGEMENT INFORMATION SYSTEMS

The work described in this paper is a continuation of work in management information systems in construction which has been going on in Liverpool for 5 years. This work has shown that senior management in both architectural practices and in building contracting companies usually rely on two major sources of information for monitoring the contractual system; periodic reports (typically compiled on site) and short personal visits, the latter being used to confirm or amend the information given by the written reporting system. Anecdotal evidence existed that the current systems were limited because they either provided too much detailed information or omitted essential items of data.

A study of the management information for contractual systems within an architects organisation has been reported at a previous CIB Symposium [1] and more recently a similar study was undertaken on a contractors organisation [2]. Both studies were conducted using structured systems analysis and design methods. In general this technique commences with an investigation in order to obtain a model of the current system, using data flow diagrams which are maps of the flow of data between activities in a system. At the end of all stages of the process the results are discussed with the organisation owning the system and any appropriate feedback built into the system. Construction projects in each of four large architectural practices, and three construction projects run by a major U.K. national contract were studied, together with the information systems within their respective offices.

In each of the organisations staff were interviewed in order to ascertain what documents were used for transmission of information and how those documents were routed within the organisation. The information obtained from the

interviews was supplemented by observation by the researchers, transcribed onto separate proforma sheets known as document flow charts which were in turn verified by the data provider.

When all documents received within the office were recorded, the individual document flow charts combined to form integrated data flow diagrams for each contract. Figure 1 is an example of a data flow diagram and shows the information used for implementing the contractual system in respect of site monitoring within a design organisation. An extract of a data flow diagram for a commercial activity within a contracting organisation is shown in Figure 2. These may form the start point for the design of new systems, and ultimately a working implementation, and details of this process for both types of organisation are given in references 1 and 2.

ACTIVITY PROFILES

In addition to the work described in the previous section an investigation was carried out of the contractual duties of an architect involved in the management of a contract and these duties were related to information requirements [3]. The work involved analysis of the information requirements of three of the major contractual forms in the U.K. (JCT Forms of Agreement for Minor Building Works, the Intermediate Form of Contract and the Standard Form of Building Contract ... with Quantities ... 1980 Edition) [4]. The information requirements were scheduled in relation to the architect's duties and it was found that the major form, JCT 80, included more than one hundred activities for the architect to perform, sometimes repeatedly, during the normal course of construction operations. Many of the individual activities themselves contained complicated sub-procedures. The significance of the degree of complexity of operation of the JCT Forms became apparent during interviews with a number of senior project architects. The purpose of the interviews was to find out what information was used, and in what ways, for their various perceived contract management tasks. It became apparent that some of the architects interviewed were not aware of all of the activities revealed as being necessary by the contract analysis. Some of those interviewed could either not remember, or did not know, the full extent of the contract management and administration duties as set out by the Form of Contract they were using. It was concluded that the activities and procedures involved in contract administration were too numerous and too complex to be committed to memory, and this in turn made effective administration of the contractual systems by traditional means a slow process involving continual re-learning of procedures.

The schedule of information provided a comprehensive statement of relationships between activities, information requirements and documented outputs of activities, but were not in a form which would be of use in practice. In order to present this information in a convenient form the schedules were replaced by a series of standard forms known as 'Activity Profiles' describing in systems terms each unique activity of the contract system [5]. Each activity profile shows.

- (i) the logical deductions that must be made and conclusions that must be reached before each activity could properly take place;

- (ii) the nature of the information required to affirm or deny the deduction or conclusion;
- (iii) sources of information (e.g. files, diaries or records).

Thus the process of contract administration is subdivided into a number of defined activities.

The use of activity profiles in their written form can be illustrated by the use of an example. The issue of a Certificate of Practical Completion is an important and complex task requiring decisions to be made on the basis of a large number of items of information. As the issue of such a certificate is an infrequent occurrence in the day-to-day duties of an architect the precise details of the procedures associated with the activity could easily be forgotten. Advice and prompting would therefore help to avoid any omissions and errors in either information gathering or decision making. Activity Profiles relating to the issue of Certificate of Practical Completion is shown in Figure 3. It lists five major types of information that are required for the decision making process. The architect is prompted to check the various reference sources to extract the necessary information. Using the information obtained from the various sources the architect is then in a position to make the necessary deductions to enable a certificate to be issued with confidence that no important item of information have been overlooked.

DATA FOR DECISION TAKING

Activity Profiles have now been in trial use within a large U.K. public sector architectural practice for two years. Experience has shown that they have been successful in acting as a source of advice and reference and that whilst the possibility of error due to the above is reduced the quality of the decision taken using an Activity Profile is still dependent on the quality of the available input data. This accords with a basic premise of systems methods at any level that if the input is of good quality then the chance of quality output is increased. Good quality input may be thought of as information that is timely, (it must be available when required); accurate (conveys true position); precise (with specified tolerance limits); and clear (can be understood by the intending receivers). The input data to Activity Profiles is typically made up of reports, records, and correspondence, together with contractual documents such as Bills and Form of Contract. The decision taking process within a contractual system which is described using an Activity Profile requires some assessment of the worth of the various items of input information. If the types of information contained on each document is examined in terms of data content, transmission method and processing method the following may be identified.

- (i) Formal data : having a fixed format. Typically measured item.
- (ii) Informal data : no fixed format. Typically queries or problems.
- (iii) Formal transmission : usually in writing or graphic form using defined channels.
- (iv) Informal transmission : typically word of mouth.
- (v) Formal processing : rule based procedure.
- (vi) Informal processing : procedure selected by user of data.

A series of combinations of the above thus results, each of which may affect the quality of the data and hence its value in the decision taking process. Contract Documents or Forms of Contract may be formal in all three respects. Other items such as site reports may contain some elements of informality, for example anecdotal accounts of progress. Furthermore an item of input data may previously have changed from one state to another, in, for example, the transcription of information from a letter to a proforma. In this case the assessment of accuracy of data cannot be made until the origin and intermediate processing are known. It is thus important before contractual system decisions are taken to identify the nature of the input data to the decision process.

The systems approach to management information systems and activity profiles are concerned almost exclusively with formal data formats. It is clear from the above however that the interpretation process for informal data could in some cases affect the quality of contractual decisions. Traditional methods of interpreting contractual systems rely on the experience of the person taking the decision to take account of the degree of informality within the data, and for this reason contractual decisions are usually taken by the senior staff in construction organisations. The activity profile concept helps by identifying all possible alternative sources of information relating to a particular decision.

The implications of data informality are more serious however where systematic methods of data transmission and processing are implemented using Information Technology. The data within the system in this case is necessarily formal in all aspects and may obscure the source and subsequent history of items of data. It is thus important that the status of the data must be made clear when using IT based management information for decision taking within Contractual Systems.

CONCLUSION

This work presents the results of a system study of some aspects of the information system which is used to take decisions relating to contractual systems. The concept of activity profiles can be used as a prompt and a source of guidance for taking contract decisions and the implications of the different classes of data within construction information system discussed.

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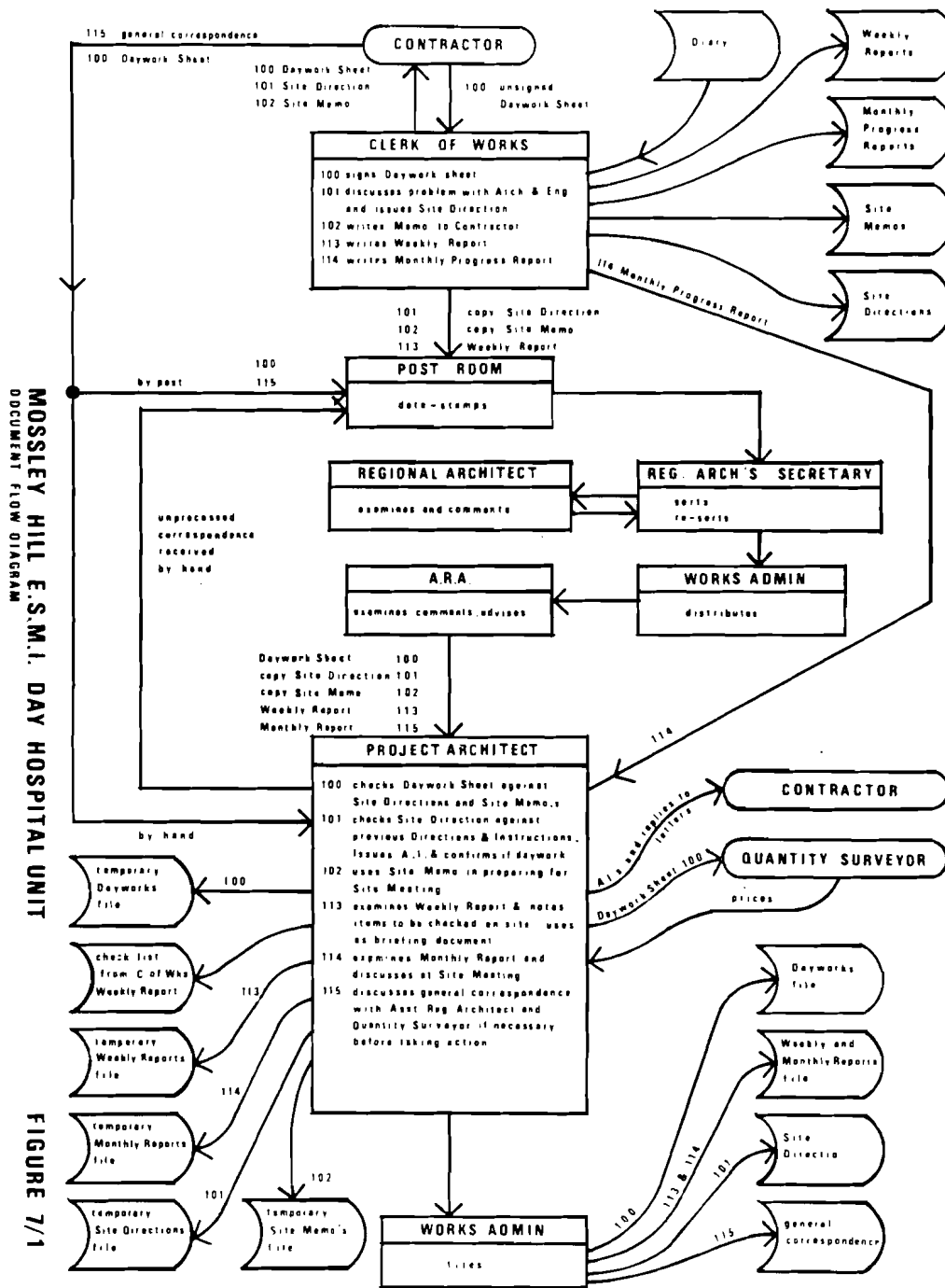


Figure 1. Integrated data flow diagram for a design organisation.

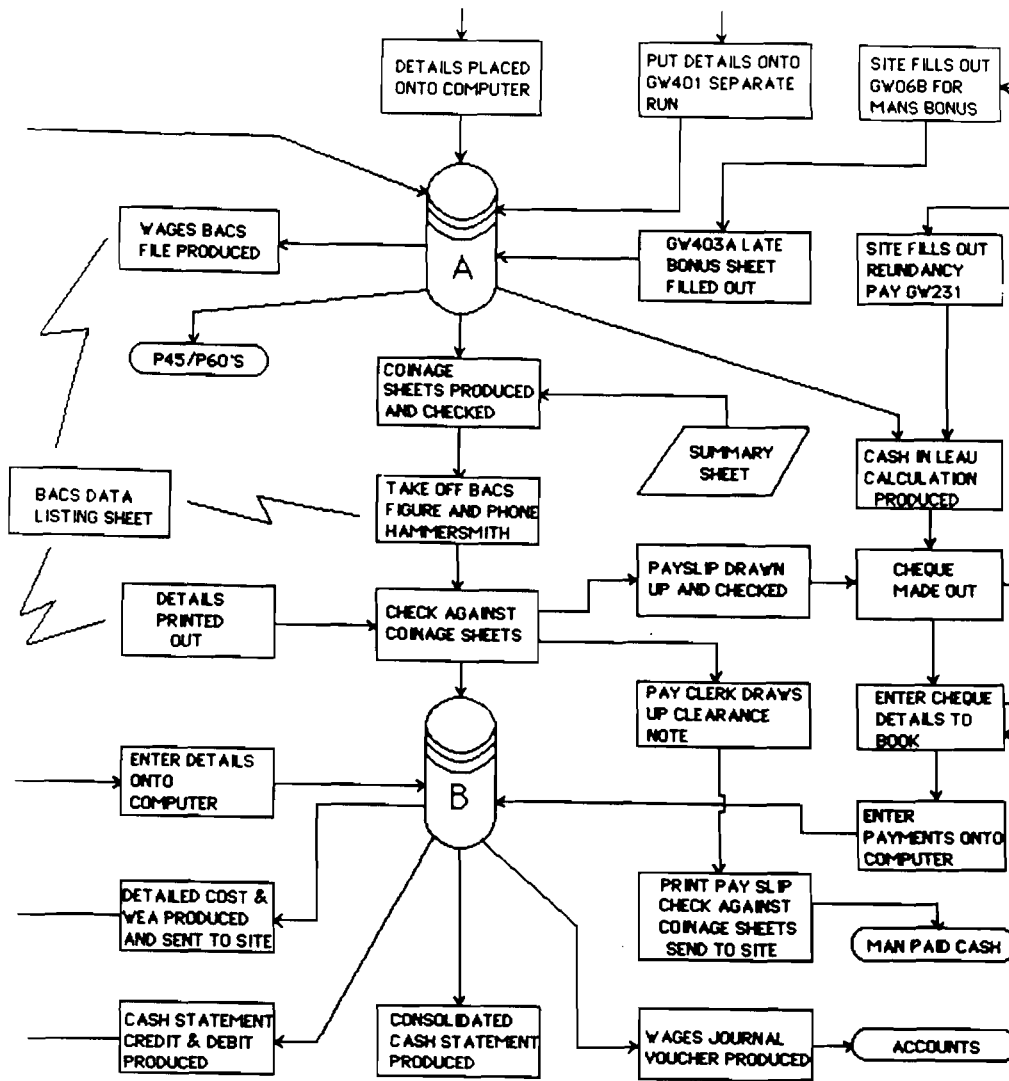


Figure 2. Data flow diagram within part of contractors organisation.

The University of Liverpool
DEPARTMENT OF ARCHITECTURE AND BUILDING ENGINEERING

A Unified System of Contract Administration for Architects

ACTIVITY PROFILE

Clause 17.1

Contract JCT '80

| | |
|---|--|
| <p>INFORMATION INPUT</p> <ul style="list-style-type: none"> * building work has been fully completed in accordance with contract requirements * systems are complete, tested and capable of being set-to-work * there has been compliance with any instructions to remove work which is not in accordance with the contract * listed defects have been remedied * <u>absolutely</u> there are no hazardous or major defects | <p>LOGICAL DEDUCTION</p> <ul style="list-style-type: none"> * the stage of Practical Completion has been reached |
| <p>REFERENCE SOURCES</p> <p style="padding-left: 20px;"> inspections reports progress records instructions defects lists Contract Drawings Contract Bills Form of Contract </p> | <div style="border: 2px solid black; padding: 10px; margin-bottom: 10px;"> <p>ACTIVITY DESCRIPTION</p> <p>issue forthwith of a Certificate of Practical Completion</p> </div> <p>Mandatory</p> <p>OUTPUT</p> <p>Certificate of Practical Completion</p> |

* a definition of Practical Completion could be inserted in Part I, General, of JCT '80 @ Practical Completion, p.11.

| | | |
|--|---|---|
| | 2 | 2 |
|--|---|---|

Figure 3. Activity profile.



International Council for Building Research Studies and Documentation

**WORKING COMMISSION W92
PROCUREMENT
SYSTEMS**

**"PROCUREMENT SYSTEMS - WHICH
WAY FORWARD ?"**

**SYMPOSIUM
10. - 13. SEPTEMBER 1990
ZAGREB
YUGOSLAVIA**

**Dr DAVID W.CHEETAM
Dr DAVID JAGGAR**

UNIVERSITY OF LIVERPOOL



GRAĐEVINSKI INSTITUT

PROCUREMENT SYSTEMS

WHICH WAY FORWARD?

INTRODUCTION

Procurement systems, the range of strategies adopted by clients to acquire buildings vary considerably. This is to be expected for clients range from individuals to large international organisations, both private and governmental. The products of the industry range from single houses or large housing developments to schools, factories, hospitals, offices, shopping and entertainment complex and the essential engineering infrastructures of railways, roads, utility services and defence works. The systems adopted reflect client size and preference; many individuals purchase completed homes built speculatively for sale, public housing authorities tend to design their own developments and then let construction contracts by competition. Some large corporations purchase speculatively built offices, other commission designs and let construction contracts. Others, both public and private sector, directly employ their own labour forces.

Changing economic, social and political contexts affect both the procurement systems used and the roles performed by the parties to the building process. Until the middle of the eighteenth century, the design and construction of a particular building was generally the responsibility of one person, the master builder or architect. The need for the building would probably have been determined by a single individual or the crown. The corporate client did not exist. The evolution of joint stock companies enabled groups of individuals to raise funds and introduced new methods of financing building works. The rapid industrialisation of society during the nineteenth century, the population growth, new forms of production and associated growth of towns and urban development created unprecedented demand for the products of our industry.

The growth of knowledge, of art and science related to construction, of legislation concerning urban development, of agreed procedures and rules for engineering design as exemplified in codes of practice, of state control of minimum standards inevitably led to specialisation of the participants to the construction process and the separation and growth of the professions. Construction has divided into Building and Civil Engineering, each with its own contractual forms and methods of measurement. There are broadly two separate professional and administrative groupings. Civil Engineering regulated by the Institution of Civil Engineers the Association of Consulting Engineers and the Federation of Civil Engineering Contractors. Building is regulated by the Joint Contracts Tribunal (JCT) on which are represented the Royal Institute of British Architects, Royal Institution of Chartered Surveyors, Building Employers Confederation, Confederation of Associations of Specialist Engineering Contractors, Federation of Associations of Specialist and Sub-Contractors, Association of Consulting Engineers and client groups such as the British Property Federation and the Association of County Councils.

Civil Engineering education embrace both design and construction of works. Graduates may enter either design consultancies or contracting organisations. Education for the building industry has separated into Architecture, Quantity Surveying and Building with the consequence that there is minimal movement of professional staff between architecture design practices and building production organisations. Building Services Engineering graduates are able to enter either design or construction organisation operating within this specialist field.

Although many of the large contracting firms operate across both civil engineering and building the legal, procedural and organisational complexity must detract from the general efficiency in providing the products of our industry.

EVOLUTION OF BRITISH PROCUREMENT SYSTEM

The construction industries have always been fragmented with trade specialisation and widespread subcontracting. Separate trade contracting by which trades were let on an individual basis and site works controlled by the architect remained in use in Scotland (which has a legal system separate from that of England and Wales) until the nineteen seventies (1). The role of the main contractor as employer of some

trades and organiser of other trades has been firmly established in England and Wales for almost a century.

Civil Engineering Contracts

The nature of civil engineering works is that they are often large and cumbersome and may be constructed on extended sites such as roads and railway projects. Much work is carried out at or below ground level and is particularly susceptible to bad weather conditions. The powers of the engineer under the standard civil engineering contract (2) are wider than those of the architect under the JCT. The contractor's mode, manner and speed of construction must meet the approval of the engineer. The engineer may require details of the contractor's temporary work and the construction plant to be used. The safety of permanent work may be affected by these and the engineer needs to establish that working methods will not detrimentally affect the finished project.

Thus civil engineering contracts are generally let on measurement rather than lump sum contracts because of the inherent uncertainty of large scale projects, often involving work below ground level. The Engineer, hence unlike the Architect, has much greater involvement in the management of the site process.

Building contracts - do Architects lead the team?

The traditional, dominant or 'normal' form of building procurement in the United Kingdom is for clients wishing to build to appoint an architect, structural engineer, building services engineer and other specialist designers who collaborate in designing a project to satisfy the client's requirement. Often the client will initially approach an architectural practice and appoint other consultants on the recommendation of the architect. Increasingly, and particularly for public works, consultants have to compete on the level of fee. Quantity surveyors provide cost advice to both the design team and client as the design is developed. They also prepare bills of quantities and often specifications to enable contractors to price the work. The successful contractor, generally the one submitting the lowest price when tendering for the works, will be appointed to carry out the work.

The role of the architect has changed substantially during the working life of those now approaching retirement. Until the introduction of the 1963 edition of the Joint Contracts Tribunal Form of Contract (JCT) they had some responsibility for organising the project on site, setting out the works. Contractual changes and changes in attitude brought about by the educational process has meant that younger architects tend to have limited interest in project management, accepting the responsibility for project durations and trade co-ordination. Most young architects perceive themselves primarily as designers. Only a small minority in large multi professional practices move to careers in project management.

Separation of design responsibility from production responsibility:

Contractors submit tenders for the construction of works against, in theory, completed designs. In practice many aspects of the design may not be finalised or represented on drawings and the bill of quantities may well include description of work that might be required but cannot be identified on tender drawings. Prime Cost items and Provisional Sums ensure that the price submitted to the client by the contractor is sufficiently large to cover most eventualities. Contractors make no contribution to design under the standard JCT 80 (3) form of contract. The architect acts as the client's agent when dealing with building contractors for there is no direct contract between the architect and main contractor.

A complex network of legal relationships:

The contract between the employer (client) and the main contractor normally involves agreement on four principal matters. Quality (of materials, goods and components in the building), quantity, time and cost. The contractor undertakes to complete the agreed quantity of work in accordance with given drawings and

specifications. The time required to complete the work and the cost of the work may be subject to change and additional payment if the employer or his agent - the architect - requires work to be increased from that previously agreed.. The employer must not obstruct the contractor in any way and must give possession of the site and pay for work done at the times stated in the contract. In ordinary circumstances the employer is required to provide drawings, schedules and all other information necessary to enable the contractor to complete the work and when not provided procedures are set down for the satisfactory resolution of my omissions.

Both parties should know and understand the full extent of their rights and obligations; documents are usually prepared as a record of their bargain. These are a formal contract (which generally consists of articles of agreement, conditions and appendices) Contract Drawings and priced Bills of Quantities. The contract documents have important legal significance and terms of agreement must define what the contractor has to do, what the employer has to do, how changes are dealt with, what happens if the contractor defaults and what happens if the employer defaults.

The contractor, whose prime task is to obtain, move and assemble materials and components to produce the building described in the contract document, will enter into further contracts. Some may be oral, some may be written but informal (perhaps merely an exchange of letters) and some will be written in unique or standardised form. There will be many contracts between main contractor and specialist subcontractors who bring particular expertise in the skills of their work force, such as plastering, roofing, or in the detail design and installation of their products such as heating systems, sprinkler systems or in the assembly of components they have designed, developed and manufactured such as suspended ceilings, curtain walling.

The use of non-standard subcontracts by main contractors employed on standard contracts is reprehensible. Many individually written sub-contracts seek to impose conditions considered by the specialist contractor to be unfair. They impose onerous conditions in such matters as entitlement to extension of time, proof of title to goods, conditions of payment, discounts and retentions. These trends to situations of greater potential contractual conflict come at a time when the industry is increasingly reliant on the design skills of trade and specialist contractors in all fields, especially building services. Building Services contractors traditionally bid on the basis of schematic designs and performance specification. Component manufacturers offer design services using performance tested components they have developed to supply essential support to architectural designers who are increasingly unconcerned about detail design. It cannot be prudent for the large main contractors to adversely affect the businesses of the specialist trades contractors on whom they increasingly depend.

Further contracts will relate to the sale of goods, employment, storage, banking, hire of equipment, insurance, carriage and so on. Each will be related to different trade usages and customs, different forms of agreement and different statutes and legal precedent. Together they result in a complex network and multiplicity of legal relationships which are not always compatible.

Recognition of the role of component manufacturers:

Public sector clients such as Hertfordshire (SEAC) and Nottinghamshire (CLASP) undertook major component design development programmes when promoting the use of off-site prefabricated components for use in school building (4) during the nineteen sixties and seventies. These components were purchased by a series of supply contracts with the consortia. Competitive bids were obtained separately for each range of products such as concrete panels, steel frames, windows and curtain walling systems. The unit prices of these components were included as nominated supply items in the general contract for which main contractors bid competitively. Each public authority member of the consortia knew the proposed scale of its building programme for one to three years in advance, each one agreed the percentage of its total building programme that would be constructed using the consortia's building system. The component manufacturers knew that if successful the company was assured of a market by being appointed the supplier of a particular product for at least a year and through the use of programme

quotations and extension contracts often for three years. These innovative public authority based procurement systems were matched by an important, though subsequently frustrated, attempt by the design team to understand fully the interactions between their designs and on site construction. A number of successful experiments showed that architects and quantity surveyors could develop competence in directly organising site works and managing both sub contractors and directly employed labour. They avoided the need to use entrepreneurial general contractors while producing good quality buildings within budget (5) (6).

The idea of local authorities collaborating to develop new ways of purchasing buildings was an attempt to develop contractual relationships which recognise changing roles in the building team. The traditional roles of architect and contractor were re-interpreted to take account of the growing importance of the component manufacturer. The War Office building programme extended the principle of serial contracting initiated by the schools consortia for the supply of component ranges to include the work of the general contractor. A modified form of two-stage procurement strategy was developed which allowed both the manufacturer and the contractor to participate and contribute their expertise in the design and development process.

Changing political priorities:

The decline of the public sector during the current conservative (Thatcher) administration, has led to the virtual abandoning of those local authority building system based procurement procedures. A less rigid contractual relationship exists between the Property Services Agency Method of Building Group (7) and the suppliers of components developed and tested to show compliance with the performance specifications developed by the group. Although the suppliers of components selected on performance and price for inclusion in the Method Handbooks have no guarantee that their particular components will be selected for use by architects in the P.S.A., they have the knowledge that should the architect wish to use components of the generic type offered they will be selected from those approved by the Method group.

During the past ten years private sector investment has dominated and large corporate clients have become more knowledgeable in that they show greater awareness of the options open to them. Contracting firms have responded to the competition created by an expanding market by directly approaching clients who are known (or thought likely) to intend to commission building. This increased marketing effort by firms has been matched by that of professional institutions, such as chartered architects, chartered engineers, chartered surveyors and chartered builders all competing for the role and task of project manager coordinating all aspects of design and on site construction on behalf of the client.

A wide choice of options:

A wide range of procurement options is now available to clients. These have been described by Swanston (8) and NEDO (9). While a desire to obtain the cheapest possible tender price may lead clients to invite open tenders by advertisement most clients restrict the number of firms invited to tender in accordance with agreed codes of practice (10). Most contracts are for firm or fixed prices but in times of high inflation price fluctuation clauses may be included. Cost reimbursement contracts may pay the contractor a fixed fee in addition to incurred expenditure while others pay a percentage of the expenditure. Target cost contracts share the savings between actual and target cost between contractor and client (11).

American construction management (12) has been adopted to U.K. use. Many different forms of management contracting have been developed (13) but after initially receiving much support they are probably now in decline. The traditional separation of design from production has been overcome by the introduction of Design and Build contracts (14), (15), (16) by which the client enters into a contract with one organisation, generally the contractor, who takes responsibility for both design and construction.

This provides the client with a single point of responsibility for a successful project and enables the design to reflect particular expertise that the particular contractor has in site production methods. There are a number of variants to Design and Build, while some firms employ all the necessary design and site production skills many subcontract aspects of design., other contractors employ only a small core of project managers and quantity surveyors who liaise with external design and trade contracting organisations (17). Design and build is the fastest growing procurement system in the U.K. (18) doubling from 5 to 12 percent of all contracts by value between 1984 and 1987. Recent estimates show that 25 per cent of all contracts are being let on Design and Build Contracts (19).

The advantages and disadvantages of each procurement systems are described in standard text such as Ashworth (20) and the Aqua Group (21), (22). Mohsini and Davidson (23) suggest that a new type of specialist should provide clients with guidance as to the most appropriate procurement systems to adopt. The situation is complex, and as a result a guide to the selection of the most appropriate Joint Contracts Tribunal Form of Contract (24) has been produced Expert systems have been developed to provide guidance on the most suitable procurement system for a given circumstance (25) (26)..

The varying levels of responsibility of subcontractors for detail design, component design, component manufacture and site assembly under typical procurement systems in USA, Japan, West Germany, and France are described by Grey and Flanagan (27). An impression of the different approaches used in Europe, main/general contracting, trade contracting, Architect co-ordination of separate trades is provided by Gow and Fenn (1). The summary tables prepared by Mathurin (28) provide an overview of the differences between procurement procedures and legal responsibilities within the European Community. The educational processes and 'formation' of the building professional varies throughout Europe (29). How might all these diverse practices be combined to best advantage of clients and in doing so be to the benefit of all engaged in the industry?

A WAY FORWARD

'La consultation performancielle'

The French CSTB has been actively promoting a procurement procedure based upon 'La consultation performancielle' (30) (31) for public sector housing and building. This requires the clients architectural advisor to produce conceptual (schematic) design, layout plans and elevations at 1:100 scale and performance specifications for each element/component. The contractors compete by submitting costed proposals, detailed design and appropriate materials specifications to ensure that the conceptual design can be translated into a realisable building. The detail design is often undertaken by Engineering consultants employed by Bureau d'etudes techniques (BET). The clients architectural consultants while not being concerned with detail design of components, connections and selection of materials must be aware of appropriate performance standards and the relevant test methods for technical evaluation of contractors proposals. A situation not dissimilar to that of architects (employed by the U.K. Government Property Services Agency) when selecting Method of Building components for use in their designs.

A link may be drawn between 'La consultation performancielle' and U.K. Design and Build when undertaken using JCT standard form of building contract with contractors design (32).

Design and Build under JCT 81 WCD

There are three main differences between this form and other forms of contract issued by the Joint Contracts Tribunal. Firstly there is no person who exercises any of the functions normally ascribed to the architect or quantity surveyor. The contractor accepts total responsibility. Secondly it precludes the employer from providing further design information once the contract is agreed. Thirdly there are no provisions enabling the employer to nominate specialist suppliers or subcontractors.

The contract documents used are; the employer's requirements, the contractors proposals, the contract

sum analysis and articles, conditions, optional supplementary provisions and appendices. The document(s) comprising the Employer's Requirements may vary from little more than a description of the accommodation required, up to a full schematic design. Any design input from the employer must be embodied in the Employers Requirements as there is no provision under this form of contract for design input from the client during the course of the contract. The conditions do, however, enable the employer to vary his design requirements by making a 'change' under clause 12.2.

Many contractors encourage clients to employ professional consultants when drawing up their schedules of requirements. The Employers Requirements should include the following:-

- (i) The function and size (and/or cost limit) of the building and the standards to which it is to be built.
- (ii) All constraints (eg planning conditions, restrictions on use of site).
- (iii) Site requirements (eg boundaries, access).
- (iv) A clear statement of what is required to be provided in the contractor's proposals.
- (v) Data necessary to complete the formal contract.
- (vi) Content and form of the contract sum analysis.
- (vii) Provisional sums.
- (viii) Details of work to be executed outside the contract.
- (ix) Details necessary to support applications for interim payments.

A clear statement of client requirements provides the key to success and eliminates the potential for the problems that might arise if the original brief is vague. The consultants advising the employers in establishing the requirements might easily state them in the form of performance specifications and link them to schematic designs. The performance specified might be the minimum standard prescribed by the building regulations or to such higher standard as the client may require.

The Contractor's Proposals, where and to the extent required, must respond to the content of the Employer's Requirements. They should be set out in drawings and/or specifications and other documents in accordance with any relevant provisions in the Employer's Requirements. Professional advisers employed by the contractor are responsible to him and are precluded from entering into any professional arrangements with the employer for the purpose of the contract.

If the Contractor's Proposals seek to amend or amplify the Employer's Requirements in any way, this should be clearly indicated and any provisional sums, as already stated, are not provided for and so need individual agreement. It is essential that the Employer's Requirements and the Contractor's Proposals are consistent and do not contain any conflicting provisions.

As there is no bill of quantities in this form, the Contract Sum Analysis is produced to assist the employer check the contractors application for interim or stage payments, to enable variations (known as changes in this form) to be valued and to provide information for the operation of any necessary formula adjustment.

CONCLUSION

The procurement strategy adopted by the client may be regarded as the sum of the individual contracts between the building owner, professional advisers and companies (or enterprise) working for the client. The set of contracts prepared for any one project must enable the client to meet the organisation's building needs as effectively as possible while the individual contracts must be drawn up so as to reflect the risks being borne by all parties to the project. The procurement system selected by the client establishes the roles and relationships amongst the individuals and organisations which make up the project organisation.

A system based on schematic design, schedule of employer's requirements and performance specifications developed from British Design and Build and French 'La consultation performancielle' may well provide the pattern for the future in Europe. It could provide the client with a single point of

responsibility, the main contractor. It could reflect the trend towards subcontractors/trade contractors undertaking detailed systems design and component design and development. It would stimulate innovation both in component design and in site production techniques such as greater mechanisation and use of robots. It would enable contractors production expertise to be reflected in the designs offered while still permitting clients to choose between alternative costed proposals submitted by competing contractors.

This approach is applicable to civil engineering works as well as to building works. If procedures and contracts were common to both there could well be an improvement in efficiency and effectiveness of the total construction industry.

The framework identified above will lead to a more dynamic and responsive situation in which the roles of the participants must change. The relative status of the design professionals, architect and engineer, will gradually become similar across all European countries. The system proposed reflects trends in architectural education and aspiration. It may be that two types of architect will emerge. Those educated in a 'beaux arts' tradition being concerned with conceptual design and determination of performance specifications employed by clients while those educated within an engineering philosophy being employed by trade and general contractors whose main concern is component selection, subsystem design, and production of assembly drawings. Such architectural designers might also have a production management role.

The implications for quantity surveyors and chartered builders are less clear, for although the functions performed by these specialists in cost control and construction management must be performed in all countries throughout Europe they are not represented by separate professional bodies outside Britain. In the absence of equivalent professional bodies it must be assumed that persons qualified as either Architects or Engineers fulfil these roles.

The ideas set out above require further development and detailed consideration of legal systems and forms of contract used throughout Europe; a topic on which the authors have limited knowledge. There must be other possibilities and the authors regret that they are not aware of any comprehensive overview of the range of systems currently in use. A single form of contract for commissioning construction work must be a realisable goal. The challenge facing us is to increase mutual understanding of procurement systems in use, the roles and responsibilities of those involved and to develop criteria for the assessment of the effectiveness of systems currently available and any future systems that may be proposed. There must be scope for rationalisation of the proliferation of systems available in the U.K. for the construction industry is driven by procedures which impeded innovation and emphasised separation.

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International Council for Building Research Studies and Documentation

**WORKING COMMISSION W92
PROCUREMENT
SYSTEMS**

**SYMPOSIUM
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YUGOSLAVIA**

**"SOME ASPECTS OF YUGOSLAV
CONTRACTUAL ARRANGEMENTS &
COMPARISON WITH
INTERNATIONAL PRACTISE IN
CONSTRUCT. INDUSTRY"**

ZORAN DIMKIĆ

**ENERGOPROJEKT - D.D. HIDROINŽENJERING
LTD**



GRAĐEVINSKI INSTITUT

SOME ASPECTS OF YUGOSLAV CONTRACTUAL ARRANGEMENTS AND COMPARISON WITH INTERNATIONAL PRACTICE IN CONSTRUCTION INDUSTRY

The purpose of this paper is to analyze and compare the position and the role of the Supervision Body in the national and international practice, especially from the standpoint of management and regulation of the contracted financial obligations between the Client and the Contractor. Therefore, financial clauses which are usually comprised by the Contract conditions have also been studied in this paper. The regulation of this essential part of a particular contractual arrangement and the Engineer's activities ensuring completion of works on time and assurance of quality of the performed works are his principal tasks at the Site. The achieved quality in performing the role set by the contract directly influences the main criteria of effectiveness of a whole project, i.e. its price, time limit and quality.

The payments obligation within a Project is regulated by a series of contractual clauses, which should reflect the country's legislation in this field. Bearing in mind the fact that the legislation is mainly based on universal legal principles, the subject matter has been treated in rather a similar way in our country and in the world. Nevertheless, implementation of a specific business practice and standards leads sometimes to considerable differences between the Yugoslav and the international construction contract clauses. Given the extensive subject matter* and numerous related contractual clauses:

- advance payment
- performance guarantee and/or surety bond for performance
- penalties and/or liquidated damages
- retention money
- interim certificates and payment
- change of unit rates and contract price
- final statement and certificate

Only the basic observations presenting parallel comparison of the clauses based on our legislation and business customs with the international practice, are given below. For that purpose the Act on Obligations and Special Usances on Construction are used to present the Yugoslav legislation, and on the other hand, as well as the Conditions of Contract for Civil Engineering Construction** (FIDIC), which are broadly accepted all over the world.

Delegation of authority envisaged by the clauses regulating the problem of the change of unit rates and the total contract price best reflect the difference in role and position of a supervision body in Yugoslavia as compared to the Engineer's role according to FIDIC.

* see bibl.references 4,5

** FIDIC, in further text

I SUPERVISION OF WORKS

In the international business practice supervision is generally performed by Consulting companies. They have wider competences than the similar firms in Yugoslavia. The Yugoslav legislation prescribes obligatory supervision over complex capital projects, but limits it to the control of quality and quantity of works. This is, however, often performed by the Employer's insufficiently trained staff. Other activities, namely control of fulfilment or change of the obligations set by the contract can be done only if the Employer authorizes it. Nevertheless, the changes in the financial sphere, e.g. fixing new rates for work items or authority to determine additional payments, are usually excluded.

The Engineer's position in FIDIC is considerably stronger. He has the right to vary the works (Cl.51.1.) or to issue the instructions for the execution of additional works being necessary for completion of the scheme. He can also introduce modifications in the project, exercise control, issue instructions concerning the manner and the time schedule of the works performance and even settle disputes between the Employer and the Contractor.

The usual Engineer's role as the Employer's agent and (partially) certifier in Yugoslav Conditions of Contract for construction and engineering works should be improved, so as to fit the role of the Engineer in the FIDIC Conditions of Contract, i.e.:

- a) his role should comprise the delegation of authority to determine additional payments;
- b) there are legal possibilities for him to assume the role of quasi arbitrator in disputes between the contracting parties;
- c) in administration of the Contract all communications with the Contractor should pass through the Engineer;
- d) the Engineer's duties under the Contract should include the instructions relating to management of the Contract, and changes in nature and extent of the works.

Consequently, it is very important that the Employer changes his attitude and hires competent consulting firms to exercise supervision over capital projects. This would improve business efficiency and will lead to a considerable reduction of the total costs and time for completion of works, which is in fact the Employer's principal interest.

In further text, the financial clauses are analyzed, especially those dealing with the change of prices and with the total damages, penalties and/or liquidated damages, which present the particularities of the Yugoslav legislation.

II FINANCIAL CLAUSES

1. Advance Payment

Yugoslav law does not sanction the advance payment. In the business practice and standards, it is treated in a similar way as in FIDIC, except that refunding of the received advance payment is to start when the the total certified value exceeds 50% of the Contract price. If the Contractor is granted the advance payment in order to procure the material, he must do it immediately and cannot ask for a change of the price due to the changed price of material.

2. Contract Fine

The difference between the liquidated damages and the penalty clauses occurring in English law is to be noticed. Either the clause provides for the liquidated damages or the penalty depends on the answer to the question whether the parties intend to make a genuine preestimate of the damage likely to ensue from the particular breach.

If the answer is yes, the clause provides for the liquidated damages, and is enforceable. The party is entitled to the agreed liquidated damages no more, no less.

If, on the other hand, the intention is to secure performance of the contract by frightening one party through imposition of a fine, then the sum is the penalty. Such sum must not be unrelated to any loss, that might follow upon the breach. In this case, the injured party is entitled to the actual damage, if any.

FIDIC in clause 47.1 prescribes the liquidated damages and not the penalties for the delay.

The situation is different in the Yugoslav legislation.

The term "contract fine" comprises:

- a) fine for an unfulfilled contractual obligation which may be applied in similar cases when the performance security is applied too;
- b) fine for the delay that can be compared to the liquidated damages for delay (FIDIC).

The basic difference between them is their respective purposes, i.e. whether it is a fine for nonperformance of the contract obligation or for the delay. In the first case, the Employer can require either fulfilment of the obligation or the contract fine, while in the second case he can claim both.

Other clauses regulating this contract fine matter do not distinguish the two types of contract fine. Its amount can be defined in advance by the contracting parties (percentage, fixed amount or by day of delay). Also, its maximum amount can be limited, but the law entitles the Employer to the compensation for both the simple

damage and the lost profit. This makes these clauses different from those in FIDIC. Besides, the amount of the contract fine can be reduced in court, if it is unproportionally large as compared to the value of the obligation, but there is also the legal possibility of payment even when the fine is larger than the damages, or when there is no damage at all. As we can see, the contract fine in the Yugoslav conditions of contract may have the character of both penalties and liquidated damages (according to English law), without a strict differentiation between a) and b). Anyway, it is understandable that the Contractor may find it more favorable to pay the contracted amount of the liquidated damages even when the Employer suffers no damage than to be liable for every damage caused by the delay, that can be exceptionally large.

3. Performance Securities

FIDIC considers the "Performance guarantee" or the optional "Surety bond for performance" as separate guarantees.

If the Contractor does not fulfill his contractual obligations, in the first case the guarantor will be liable for the so caused damages to the amount stated in the guarantee, while in the other case the guarantor is responsible to complete the contracted works or invite to tender and organize works through the most favorable tenderer, or to pay to the Employer the sum necessary for completion of works to the amount stated in the guarantee form. There is a crucial difference between these performance securities (FIDIC) and the contract fine for nonperformance of obligations under contract (YU).

The Yugoslav legislation also enables application of an unconditional bank guarantee.

Summing up everything afore said, the General Conditions of Contract for Procurement of Works in Yugoslavia should, similarly to FIDIC, prescribe only the contract fine for delay in the form of liquidated damages and bank guarantees for proper performance of contract obligations.

4. Retention Money

Yugoslav law does not sanction it, except through business practice (customs) providing a possibility of eliminating defects in the final certificate, only. There is no obstacle to introducing retention money as securities held by the Employer in respect of defects, as in FIDIC.

5. Payment (Interim and Final Statements and Certificates)

Yugoslav law does not sanction it, and business rules are applied, regulating the related procedure and activities, but in rather a different way and to a more limited extent than in FIDIC. The interim statement should be approved by the Engineer, but even without it, the Employer must pay for the actually executed works; otherwise the Contractor will take the matter to court, stop

performing the works unless the Employer fulfills his obligation within an adequate deadline or even terminate the contract, with the Employer being liable for the damages (Act on Obligations).

6. Change of Price and Unit Rates

The Yugoslav legislation defines the terms of change of the works price.

- a) Unless the adjustment of the cost is stipulated in the Contract, the price will be corrected if the value of changes exceeds 2%, of Contract Price, i.e. 5%, in the case of the Contractor's delay.
- b) If a fixed price is contracted, an increase may be introduced in the case of a change exceeding 10% of the Contract Price.
- c) The Employer may even terminate the contract (with all legal consequences ensuing from such an act) on condition the changed price is considerably increased.
- d) The price may be lowered due to minor defects regarding the material and works.
- e) A modification of the unit rates may result from the total contract price change exceeding 10% (due to modified quantities). In this case a new written annex is to be appended to the contract, as in the case of additional works.

FIDIC stipulates the change of the unit rates if particular quantities vary by more than 25% and if the total contract price is varied by more than 2%. There is possibility for changing of the total Contract Price if the value of the varied works exceeds 15% of the effective contract price, having regard to the Contractor's Site and general overhead cost.

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**"IMPACT OF PROCUREMENT
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SINGAPORE & MALAYSIA"**

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IMPACT OF PROCUREMENT SYSTEMS ON DEVELOPMENT OF THE CONSTRUCTION INDUSTRY IN SINGAPORE & MALAYSIA

INTRODUCTION

In principle, construction services should be procured with the aim of achieving economy and efficiency¹ - however, for countries developing a domestic construction industry, this long-term objective must be reconciled with the need to foster nascent construction entrepreneurs in the shorter-term. This is consistent with Drewer's findings that "the problem for any (developing) country is not simply realising a specific volume of construction, but what is constructed, why is it constructed, by whom is it constructed, and for whom is it constructed."²

Towards this end, and in response to socio-economic and nationalistic pressures, both countries have adopted post-independence policies to nurture the development and technological advancement of their respective domestic construction capability in this vital 'growth-initiating growth-dependent'³ sector of developing economies. Whilst the island city state of Singapore may not necessarily fall within the categorisation of a 'developing' country, it shares a similar industry structure and problems with its peninsular Malaysia neighbour and should present some contrasts.

It is proposed to review at the microeconomic level, specific industry-related initiatives incorporated into the procurement systems to enhance this development.

HISTORICAL PERSPECTIVE

Singapore and Malaysia, through inextricable links in history, share a common arrangement with Commonwealth countries' procurement systems primarily through their administrative machinery inherited with independence from British colonialism thus reflecting the United Kingdom's (UK) traditions in tendering procedures and contractual arrangements. Continuing links, especially in education and professional affiliations, have greatly influenced and ensured this parallelism in the procedures and practices of both countries' public and private sectors.

In addition, as the public sector has always been a traditional source for tapping expertise and trained personnel this pervasive historical influence has further extended similarities into the *modus operandi* of the private sector.

Thus, unless otherwise distinctly identified, all observations apply equally to the two countries.

THE PROCUREMENT SYSTEMS

Essentially, the establishment of a procurement system would necessarily be the embodiment of procedures, conditions and criteria for the selection of a competent contractor at a competitive price. In this context, the conventional 'open tendering' currently practised reflects much of the 'traditional multi-stage selection' reported in the survey by McCanlis⁴. In practise, the local arrangements replicate much of the procedure recommended in the latest UK's NJCC 1977 Code⁵, essentially following distinct chronological stages viz.:

**SELECTION
INVITATION
DOCUMENTATION
SUBMISSION
ASSESSMENT
AWARD**

However, a significant difference between local practice and that found elsewhere is the requirement (much akin to option 5.2 in the code for Scotland only), that;

"The priced bill(s) of quantities.....should be submitted at the same time as the tender."

Undoubtedly, this requirement has contributed to the cost of abortive tendering which ultimately must be reflected in the prices of building. Whilst in the main the guide-lines set out in the code are generally followed, it is proposed to outline the private and public sectors' approaches separately, especially in the Selection and Documentation stages, where the interposing of conditions are intended to foster development.

The Private Sector

Procurement on a 'selective competitive tendering' basis is undertaken by professional advisers on behalf of clients following the practice of other countries.

Selection of the short-list, varying from 9 or more tenderers as indicated in a survey of Singapore quantity surveying firms by Yeo⁶, is drawn from an *ad hoc* 'in-house' register or from the public sector's registry.

Documentation is based either on bills of quantities or on drawings and specification (for works of value <USD 0.3M). In the main, projects of magnitude are normally based on full bills of quantities prepared by consultant quantity surveyors. Until the recent unilateral adoption of the SIA87⁷ form in Singapore (which is radically inclined towards more single point responsibility), documentation for both incorporated a common standard *with/without quantities* contract proforma essentially drawn from the provisions of the JCT63⁸ form.

A detracting feature that would affect the contractors' strategic tender planning is the requirement that the tenders remain valid for periods ranging from 60 to 90 days compared to 28 to 56 days in the NJCC 1977 code. Yeo's survey also indicated limited tender periods of 3 to 4 weeks for bills of quantities tenders not exceeding USD 5.5M, and 4 to 6 weeks for larger tenders or those based on lump sums. A further not uncommon consideration experienced is the practice of post-tender negotiation - even with the lowest tender submission!

The Public Sector - Singapore

Government procedures are devised to serve as a system of checks and balances ensuring, as a matter of public policy, that all eligible contractors are provided with a fair opportunity of bidding for a project and that the project is eventually awarded on a consistent criteria⁹. Thus, procurement for all government agencies and statutory bodies, like the Public Works Department (PWD), are subject to guidelines issued by the Ministry of Finance¹⁰.

Selection of the 'short' list, owing to the need for public accountability, is on an 'open tender' basis by advertised tender notices in the media restricted only to the appropriate heads and grades (G1 to G8 by value of works ranging from <USD 55,000 to >USD 17m respectively) with the Construction Industry Development Board (CIDB)¹¹ as the Registration Authority - major works in excess of the highest financial limit are invariably prequalified.

An undesirable and not uncommon feature of 'open tendering', even with implicit 'prequalification' restriction to respective class of registration, is the often extensive list of tenderers, occasionally up to 20 in number.

Documentation of design drawings and specification are generally very detailed and comprehensive, and primarily for expedient reasons, is the basis for the letting on a 'lump sum' (*without quantities*) of the majority of building and civil engineering works, including the public Housing Development Board's (HDB) programme. Tender documents would incorporate one of the agencies' standard form of contract; however, as mentioned by Chow, "one of the difficulties encountered in the local construction industry is the presence of many (something like eighteen) different forms of construction contracts."

The Public Sector - Malaysia

Similarly, procurement procedures are well documented under Treasury directives which have been duly compiled into a guide for the administration of public works contracts¹². The primary determinant of the procedure to be followed is the source of funds viz. that work financed by the World Bank or Asian Development Bank are subject to the procurement procedures laid down by them.

Selection of the short list is tempered by "the policy of the Government to reserve 30% of the total value of work for *bumiputra* (sic) contractors" in order to nurture the construction entrepreneurial development of this indigenous section of the population. Similarly, the general policy is for 'open tenders' restricted only to the particular class of registration (A to F by value of works ranging from >USD 3m to <USD 35000 respectively) - likewise, abortive tendering is evident, particularly during the industry's down-cycle, where tender lists exceeding 40 have been experienced!

Documentation " for all contractsmust be based on bills of quantities" is *de rigueur* provided for in the guide and is increasingly applied to civil engineering works. The preparation of a local civil engineering standard method of measurement is currently in progress.

CHRONOLOGY OF STRATEGIES

Whilst the Singaporean and Malaysian experience may not necessarily be unique, it is hoped that some of following initiatives outlined will be instructive. To date, selective intervention to develop the indigenous construction capability have generally fallen under the following generic categories :

Protectionism

Essentially borne out of the traditional argument that infant industries require support and protection, most initiatives adopted may well fall within the ambit of this broad objective. Beyond the generally universal requirement for local incorporation, these include indirect licencing through accreditation with an approved registration authority extending to minimum local equity participation requirements intended to foster the formation of joint ventures.

As seen in the Malaysian experience, measures on tendering preferences in the public sector include a national policy for the reservation of 30% of public sector procurement exclusively for indigenous contractors in addition to a general 'locals only' limitation effectively excluding foreign participation to works of a minimum ceiling value. However, the circumvention of some of these requirements through local incorporation is not uncommon.

In the Singapore experience, the HDB had previously, with a view to nurturing a core of good local builders for its extensive housing programme, introduced a Building Core-Contracting Scheme (BCCS) to provide opportunities and incentives for the contractors to upgrade professionalism, technology, mechanisation and management. Selected contractors had to be local with at least 5 years experience as a HDB contractor and have executed a minimum of USD 40m in that period - amongst others (mentioned later), incentives included a guaranteed workload on a negotiated basis, and upon satisfactory performance, a premium of 5% on the negotiated sum!

The further promotion of local upstream support industries is generally effected through the preferred specification for the incorporation of locally manufactured components (in the form of an approved materials/suppliers list) in preference to imports; no doubt with a view to minimising the foreign exchange component in construction as well.

Economies of Scale

The high volume of turnover undertaken by agencies like the PWD Malaysia and the HDB, not only enables bulk or supply arrangements of key construction materials such as cement, bricks and steel to be made at economic prices, but also helps to minimize the financial risk particularly to the smaller local contractors with these materials being supplied at fixed prices through the employer.

The commercial leverage afforded by the virtual monopsony in public housing in Singapore (to date housing some 87 percent of the population), added opportunities for the HDB, through its iterative programme, to successfully incorporate into its contracts innovative techniques like metal systems formwork, modular coordination in design and presently, an open prefabrication concept in particular components.

Manpower Development

In essence, special provisions are incorporated into the conditions of contract requiring the employment and on-site training of trainees as part of the countries' manpower policy - the employment of Construction Brigade men as part of their National Service attachment has been in effect in Singapore since 1981.

Presently, Singapore firms seeking registration with the CIDB are required to have minimum qualified personnel resources - to facilitate this a formal training, trade testing and certification centre has been set up to produce skilled craftsmen for the industry. In addition, the HDB contractors are required to employ a specified percentage of skilled workers as part of their workforce - by annual revision to its contractual requirement, the Board aims to have a fully certified workforce by 1995!

Mechanisation

Schemes to promote mechanisation to improve productivity and to help overcome the tight labour market in Singapore (where the population of foreign workers have fluctuated between 40,000 to 60,000 in recent years) fall essentially within the purview of fiscal policy. In recent years, schemes implemented within the tax regime include the Accelerated Depreciation Allowance scheme as provided for the manufacturing industries, and the Investment Allowance Scheme, particularly for construction companies with minimum 50% local equity.

Others by government agencies include soft term loans and flexible equipment leasing under the Small and Medium Enterprises Financing Scheme.

In addition, the HDB had under the BCCS extended interest free financing for mechanisation of approved equipment intended for HDB work beyond its initial limit loan ratio of 1:15 (previously USD .67m for every building contract exceeding USD 10m with the Board) to an unlimited basis!

Preferential (Tender) Margin Scheme

In principle, when the effective lowest local bid is price-matched against the absolute lowest foreign bid, and does not exceed a stipulated percentage (5% being the norm, subject to a maximum sum), the award favours the local contractor. Inasmuch as the direct financial advantage is to ensure a healthy share of work allocation, it is also intended to encourage more meaningful local-foreign joint ventures with a view towards fostering a transfer of technology and management expertise.

Price-matching in Singapore is presently extended to further encourage quality workmanship with the linking of the tendering advantage percentage premium varying with the annual rating attained in Construction Quality Assessment Scheme (CONQUAS) undertaken by the CIDB.

Contract Practices

In the main, the mechanism offered through contract practices is the most likely to directly impact on the financial risk element of construction enterprises. Arising from the need for more equitable arrangements, standard forms of contract have included provisions for adjustments owing to fluctuations in the prices of labour and selected materials, and the elimination of traditional retention sum provisions substituted by an appropriate security bond to facilitate the contractors' cash flow.

Traditionally, in order to facilitate the need for early cash flow, contractors have been permitted to 'waiver' and assign the right to receive payment to banks as 'collateral security' for financing facilities in the form of 'overdrafts'. To further aid the limited capitalisation common in the industry, and particularly for contracts of magnitude, measures have included special provisions for advance payments on the award of a public works contract (the Malaysian proforma allows an advance of up to 15% of the value of the builder's work value subject to a maximum in the region of USD 1.9m) subject to the contractor producing a banker's guarantee for repayment of the same amount - in practice, this together with the mandatory requirement for 100% collateral security by banks has limited the feasibility of this well-meaning provision.

In the broader context of preserving cash flow, the Singapore authorities have by statute interposed into private sector purchase agreements between developer and purchaser which in essence provides for a mandatory percentage of construction loans certified for payment to be withheld (by the financing bank) for the contractor. In sharp contrast, where no such legislative protection has been extended in Malaysia, a 'cash-flown' situation with 'over-gear'd' speculative developers who have turned insolvent, has contributed to many contractors demise in the recent recession in the property sector.

Other initiatives have included the 'slicing and packaging' of larger projects mentioned by Henriad, to create added work opportunities especially for the smaller domestic contractors.

CONCLUSION

In the light of criticisms that traditional efforts effected through the varied direct and indirect measures for the development of the construction industry in developing countries have "concentrated on the symptoms, in many cases, without considering the root causes,"¹³ innovative proponents for selective intervention should well consider Drewer's observations on a structural perspective that,

"Conceptually, construction must be seen as the end product of a number of industries, rather than as a single industry.....developing countries should exploit the variety of options which this analysis suggests do exist. They do not have to accept a 'model process' imported from or imposed by the industrialised countries; they can adjust the organisation of the process, the main dimensions of demand, and the institutional environment to satisfy their key development criteria."

In conclusion, it would be most apt in the wider context of the development of the industry, to reiterate the conclusions stressed by Henriod that,

"the strategies for developing the domestic construction industry will require concerted actions by a number of sectors and need to be sustained over long periodsThe strategies will only succeed if the government is committed to them and is willing to sustain the actions and implement the reforms that are needed."

Amongst others, he noted the need for "the assignment of the responsibility to a government office for promoting the development of the construction industry." In the Singapore context, its CIDB since incorporation to oversee the development of the industry epitomizes the focus and momentum needed, and is to be emulated.

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International Council for Building Research Studies and Documentation

**WORKING COMMISSION W92
PROCUREMENT
SYSTEMS**

**"THE DECISION TO TENDER
WITHIN CURRENT CONTRACTUAL
ARRANGEMENTS"**

**SYMPOSIUM
10. - 13. SEPTEMBER 1990
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YUGOSLAVIA**

R.A. EASTHAM

SALFORD COLLEGE OF TECHNOLOGY



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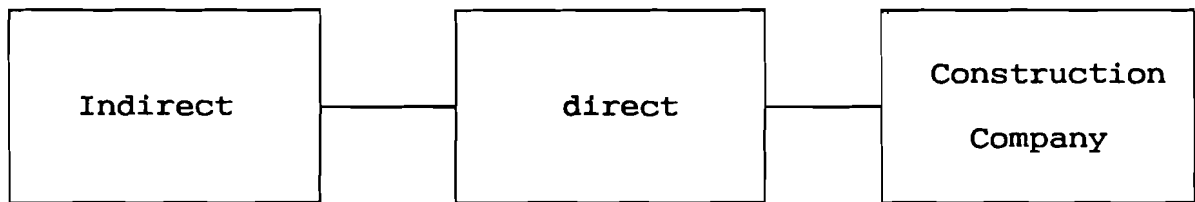
**THE DECISION TO TENDER WITHIN CURRENT CONTRACTUAL ARRANGEMENTS:
Some preliminary thoughts.**

GENERALLY

The construction process may be described as a 'hypothetical construct' suggesting quite rightly that any construction project is a hypothesis which develops through its stages into reality. This process must be seen as one which starts with the germination of an idea (inception) and finishes with the ultimate destruction of the project (Demolition). The Construction industry is complex and has a fragmented nature manifesting itself in the diversity of activities not only within the industry but within individual firms generating intense competition caused by a large number of firms competing in a decreasing market. Because of this complexity it is intended to address the issues of tendering and contractual procurement through the vehicle which may be described as the 'traditional' method of construction acquisition, competitive tendering. Recently concern has been expressed by the National Joint Consultative Committee for Building, Chartered Builder News 1990 about the apparent attitude of contractors to what clients believe is their [the contractor's] obligation to submit a bona fide bid for construction work once having agreed to tender. This criticism exists despite the fact that within the United Kingdom codes exist which recognise the need for regulation.

Within a complex industry it is reasonable to expect a complex infrastructure evidenced by the diversity of company size and hence potential management capability. Indeed the construction industry may be defined as a risky industry with uncertainties that management has to deal with. Generalisation is difficult especially considering the uniqueness of each individual project and therefore, the procurement and tendering requirements. This paper describes current research which attempts to understand the complex tendering procedure within the traditional procurement system linked to the ultimate decision whether or not to tender, and if so what type of tender to submit.

Eastham (1986) suggests that there is a hierarchy of influence which exists within the construction operational environment comprising two quite independent factors classified by the degree of control which the contractor can apply to each and may be expressed as:



The contractor believes he (as an individual entity) has little or no control on the Indirect factors whereas he can influence those having a direct bearing on the construction company. Indirect factors include Government Policy, Economic trends, technical advancement, etc., whilst Direct factors include availability of financial resources planning, input and output markets etc. It is within the input and output markets that the perception of client interest may be examined. The simplistic acquisition model may be suggested as

- Inception
- Design
- Tender
- Construct
- Acquire

and in more detail the tendering decision process may be represented as: Figure 1.

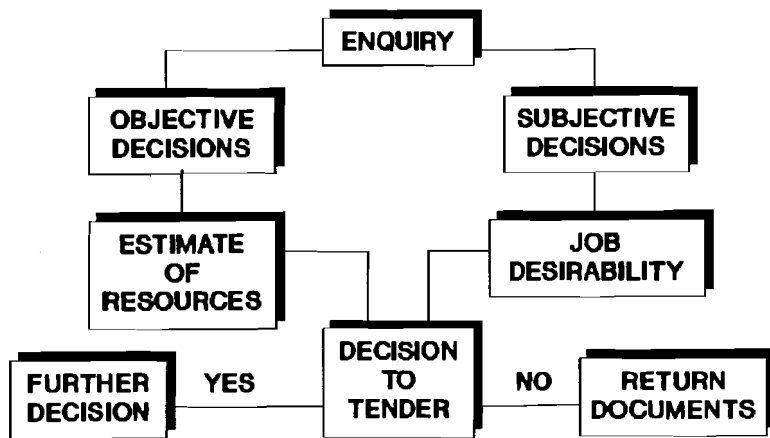


Figure 1 : Model of Tender Decision

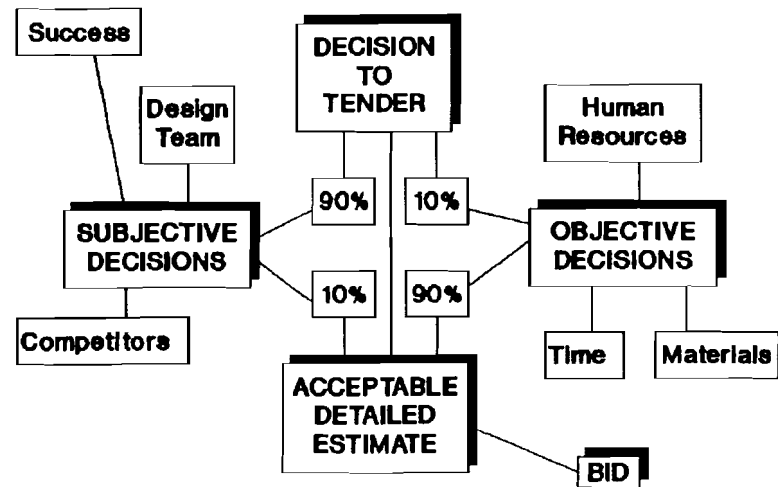


Figure 2 : Weighted Influence of Decision Types on Tendering Process

There is a link between the contractor's willingness to tender and final acquisition which figure 1 suggests but further consideration is required in respect of type of tender, if any, which is submitted.

It is suggested that the decision to tender is based around 'Resources' and 'Job Desirability' and that these are influenced by **Objective Decisions** the effect of which the contractors believe they can accurately quantify, and **Subject Decisions** the effect of which the contractors believe they cannot accurately quantify. Objective decisions are based on, for example, human resources, time, materials, etc., whilst subjective decisions are based on more abstract concepts such as the design team, competitors, success probability, etc. The influence of the decisions on the tendering process as progression takes place from enquiry to bid are given as Figure 2 and demonstrate a change of emphasis from the abstract to the factual.

The initial research, whilst valid, only contained average data based on the perception of contractors' estimators solicited using unstructured interviews but nevertheless provides an adequate model of the decision making process during the production of a tender.

What of the 'Decision of Tender'? The model suggests that it is a simple decision of either yes or no. But is it? Fellows and Langford (1980) examined decision theory and tendering in which they addressed the question of quantification using statistical probability through the medium of decision analysis. I have suggested that if the initial decision is yes, then there are further decisions required to be made i.e. the degree of non-submission and that this decision is influenced by factors other than merely statistical probability.

DECISION MAKING

A decision is defined as "The action of deciding, settlement, determination, the final and definite result of examining a question; the making up of ones mind on any point or on a course of action; a resolution" Oxford English Dictionary (1961).

Within the management literature the definition of the decision itself appears to be taken for granted. Various authors do however comment on definitions of decision making, for example Drucker (1977) and Ofstad in Eilon (1969). What is apparent is that the essential ingredient is that the decision maker has several alternatives and that this choice involves a comparison between the alternatives and evaluation of their outcome. Though decision making has never been easy, it is especially challenging. In an era of accelerating change, the pace of decision making has accelerated. According to Toffler (1980) "...the very speed of change introduces a new element into management, forcing executives, already nervous in an unfamiliar environment to make more and more decisions at a faster and faster pace. Response times are honed to a minimum".

Decision making may be considered as

- a) interdisciplinary
- b) a systematic process
- c) information based
- d) about uncertainty
- e) concerned with action

and in dealing with the acceleration effect present additional tough challenge to decision makers.

It has been suggested, Leigh (1983), that one of the most popular intellectual pastimes of managers is to dream up new ways of fragmenting the decision process attempting to form discrete easy to understand stages. These are aimed at providing a framework which will guide managers in dealing with large or small decisions and generally have two things in common:

- a) a belief that the decision making process is central to the role of management
- b) that decision making should be a rational series of predetermined steps.

Because there is uncertainty as to how human beings make decisions the justification for any particular form of decision framework as a prescriptive tool is severely limited. Decision frameworks, however, are not a panacea for bad decisions, they are merely a tool which needs to be used sensibly.

Archer (1980) examined over 2000 managers and compared the decision steps or phases across a variety of approaches. He concluded that all the methods used shared certain similarities but there remained a lack of consensus about definitions and in some cases key steps were missing. He synthesised the various methods to produce an integrated nine step decision framework given as Figure 3. Leigh (1983) however suggests a more simplistic framework involving a series of sequential steps

- 1) Find an occasion for making a decision
- 2) Find possible courses of action
- 3) Choose among alternatives
- 4) Evaluate past choices

If this is applied to the decision to tender or not an example may be:

- 1 - occasion - enquiry received - unsolicited or by marketing
- 2 - course of action - job need - sliding scale yes to no
- 3 - alternatives - no - cover - vague - detailed
- 4 - evaluation - statistical data on past performance.

RESEARCH METHODOLOGY

Too often surveys are carried out on the basis of insufficient design and planning and no doubt the approach adopted may be viewed by some in this category. The problem of loss of information, of condensation and compression should however be placed in perspective. The question is not how loss of information can be avoided but rather at what point can information be afforded to be lost. Clearly open questions offer the least loss but generally produce average data whereas closed questions provide comparable reliable data provided they address the problem. To this end the questionnaire contained the following in respect of tendering details in an attempt to ascertain the degree of 'non submission'

Tendering Details

Based on an average number of 100 enquiries what number would be treated as follows

| | |
|---------------------------------------|-------|
| Outright rejection (Enquiry returned) | _____ |
| Cover price | _____ |
| Vague estimate | _____ |
| Detailed estimate | _____ |

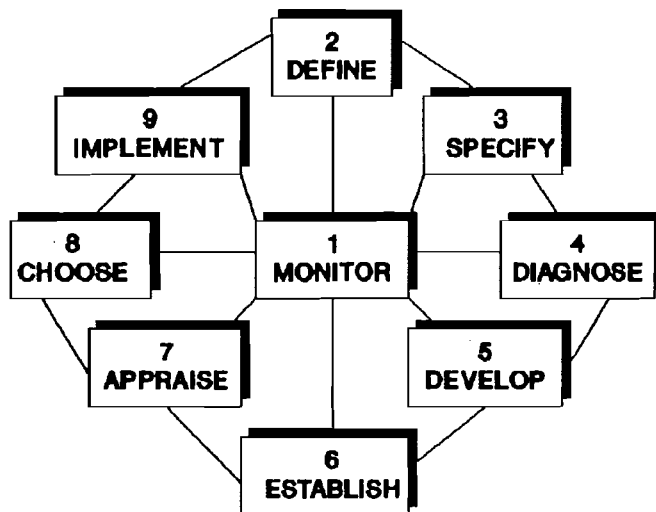
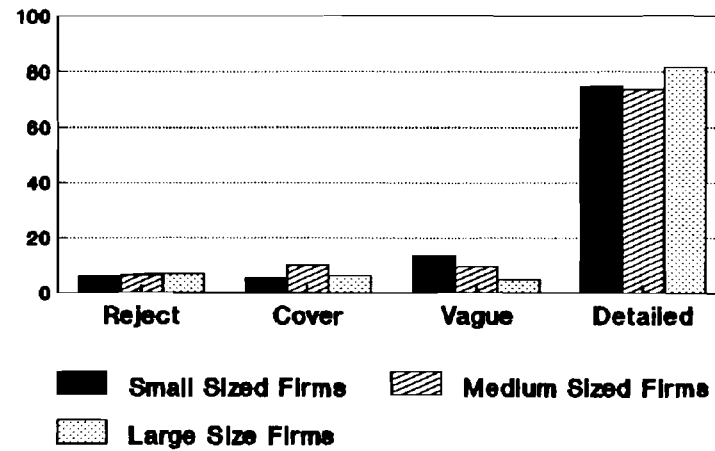


Figure 3 : The Nine Phase Decision Making Process
Archer ER (1980) page 58

Figure 5 : Type of Tender Submitted
Sample Means (% of total tenders rec'd)



For purposes of the questionnaire the following definitions were given:

| | | |
|---------------------|---|--|
| Outright rejections | - | any enquiry which is returned to the client unpriced at any stage in the tendering process whether the enquiry is unsolicited or through the company's marketing strategy. |
| Cover price | - | any estimate which is submitted without significant calculation having a knowledge of competitors' prices. |
| Vague Estimate | - | any estimate which, whilst calculated, does not take into consideration detailed analysis and synthesis of rates. |
| Detailed Estimate | - | any estimate which is based on detailed analysis and synthesis of rates. |

It was decided to use an unsolicited postal questionnaire and to this end the selection was made using randomly generated numbers and applying these numbers to consecutive entries of construction firms in Sell's Building Index (1986). One hundred and fifty contractors were selected and the details sent to them. Despite the fact that the results are presented in respect of large, medium and small sized contractors, no conscious effort was made to ensure an even balance between the three categories. In all 51 responses were received and analysed.

ANALYSIS OF DATA

For the purposes of analysis contractor size has been classified as:

| | | |
|--------|---|---|
| Small | - | a turnover less than £5m per annum. |
| Medium | - | a turnover of between £5m and £10m per annum. |
| Large | - | a turnover in excess of £10m per annum. |

Figure 4 presents the frequency distributions across the whole sample expressed by type of tender submitted as a percentage of total tenders received. As might be expected 13 contractors did not submit cover prices.

The Code of Procedure for Single Stage Selective Tendering (NJCC 1989) states "4.1.3. Once a contractor has signified initial agreement to tender it is in the best interests of all parties that such acceptance should be honoured". This however is coupled with the issuing of a preliminary enquiry detailing the work to be undertaken and a minimum period of 20 working days in which to produce the bid. As part of the overall research on 20 projects submitted for tender a summary of tender periods is given as Table 1.

| | Calendar Days | Working Days |
|--------------------|---------------|--------------|
| Mean | 34.4 | 21.4 |
| Standard Deviation | 14.6 | 7.7 |
| Min Value | 3 | 3 |
| Max Value | 75 | 44 |

Table 1: Summary of tender periods.

Figure 4 : Frequency Distribution

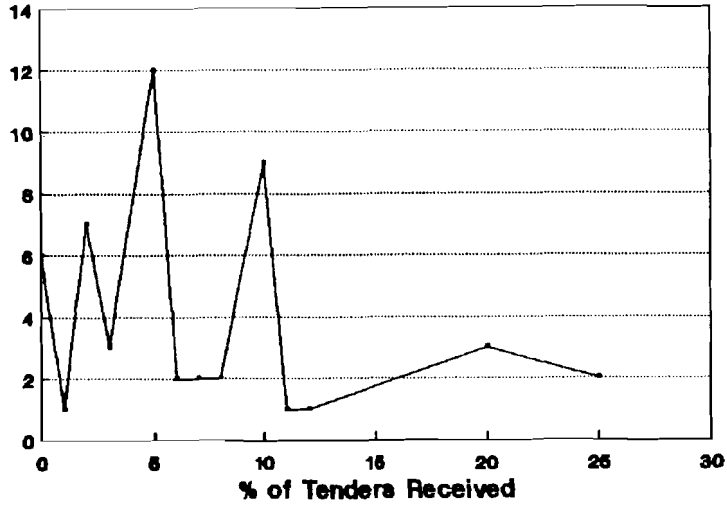


Figure 4a : Tenders Rejected

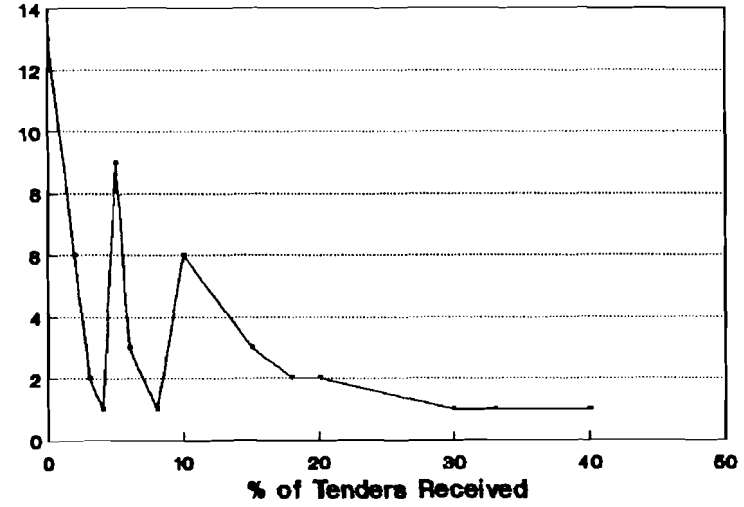


Figure 4b : Tenders Cover Price

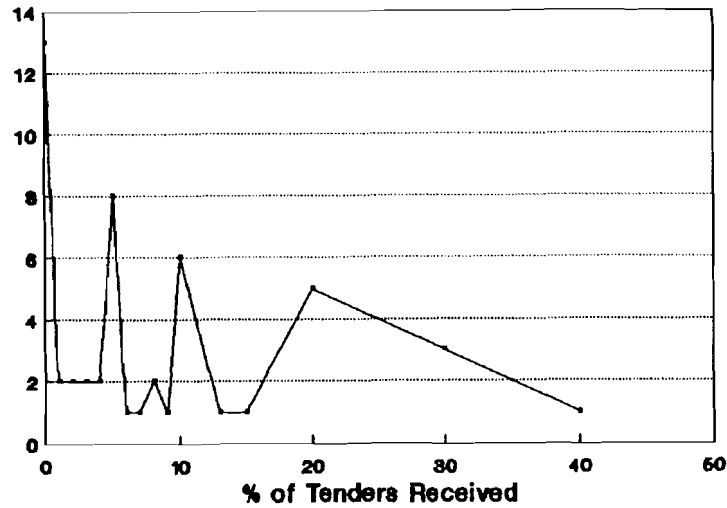


Figure 4c : Tenders Vague Estimate

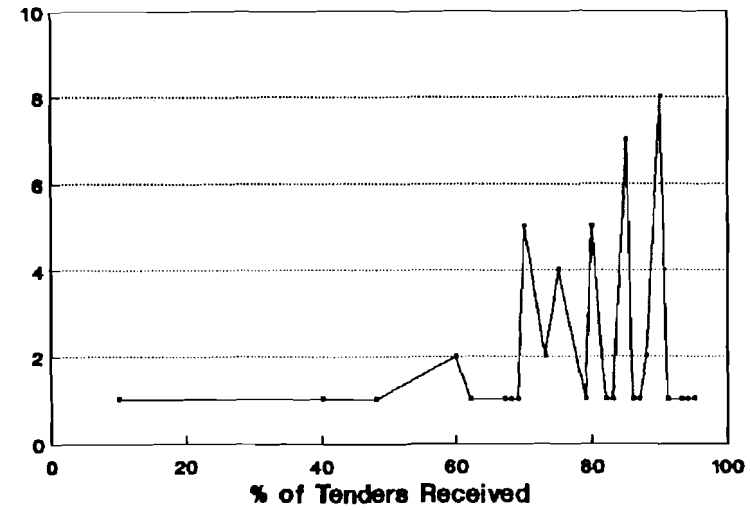


Figure 4d : Tenders Detailed Estimate

This suggests that some clients have little thought of the code in fixing time periods for tendering and indeed of the 20 projects considered the time allowed on 8 of the projects included construction industry holidays. The code does allow for withdrawal "...in exceptional circumstances" but 'exceptional' in what respect. Few clients would consider withdrawal because of, for example, better financial prospects related to another project as 'exceptional'. However on average 6.75% of tenders are returned without bid being made.

Perhaps because of fear or ignorance contractors are wary of returning tenders unpriced to clients. Cover prices, type 2 tenders or whatever name is applied are frowned upon but do exist. Contractors who think they will be disadvantaged or excluded in future tenders and who do not have resources or will to submit a tender do resort to this tactic. On average 7.30% of tenders are submitted as cover prices. What should be of concern is that 10% of contractors on average submit 20% of their tenders as cover bids indeed the maximum value recorded is 40%

The submission of vague estimates is, it would appear, a new concept. It was previously never considered that contractors would submit bids which were not thought to be detailed considerations, but on average 9.32% do. Indeed 20% of contractors submit vague estimates on 20% of the tenders received.

There was little surprise in respect of detailed estimates being submitted as bids. What is interesting is that on average 76.76% of bids are based on detailed estimates and that no single contractor submitted detailed bids on all tenders received.

What should perhaps be viewed with more concern is that on average 23.34% of tenders sent out to contractors do not result in detailed bids.

Figure 5 expresses the returns by firm size and whilst there are observed differences these are statistically not significant. It is thought that the trend between small medium and large size firms is as expected and reflects the differences in management ethos and capability.

CONCLUSION

The decision to acquire a building by a client is not taken lightly. It is born out of professional advice attempting to give value for money. Within the overall process, contractors play a major part and one of the functions of the design team is clearly to anticipate the reaction of contractors to the invitation to tender. There is little evidence that such anticipation takes place. The Code of Procedure for Single Stage Selective Tendering sets down guidelines which contractors are expected to comply with, for example, to submit a bona fide bid [in all cases] and which clients appear to adopt if it suits them, for example, number of tenderers, tendering period, etc.

The collected data suggests that on average clients do allow 20 tendering days but concern needs expressing having regard to the minimum value of 3 days and the severe reduction in overall days for such things as recognised industry shut down periods, for example, two weeks at Christmas.

Employers are increasingly interviewing contractors as to their suitability prior to invitation to tender but object to contractors carrying out the same evaluation and deciding not to submit bona fide tenders. Contracting companies are commercial concerns and as such are influenced by profitability. Through their marketing policies, unlike clients who are concerned with one project, enquiries are received continuously and contractors will take decisions to ensure achievement of their financial goals. There is evidence to suggest that contractors are influenced by such things as numbers of contractors tendering, past performance of design teams, quality of information, etc., and clearly this influences to type of tender submitted.

Clients need to understand that generally contractors will accept invitations to tender and whilst there is no evidence presented, in conversation with estimators from large contractors they were surprised at the percentage of tenders returned believing that a 2% rejection of invitations to tender is seen as an absolute maximum. There will be changes made to this initial decision as other factors become evident and clients must accept rejections from contractors during the tender period for reasons which are not 'exceptional circumstances' but are commercial decisions. With this change in attitude it is possible to

achieve on any one project 100% detailed well thought out bids albeit from a smaller number of contractors, thus reducing the cost to the industry of abortive tendering cost and hence the passing on of this cost to clients.

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**WORKING COMMISSION W92
PROCUREMENT
SYSTEMS**

**"SETTLING DISPUTES ON
CONSTRUCTION PROJECTS"**

**SYMPOSIUM
10. - 13. SEPTEMBER 1990
ZAGREB
YUGOSLAVIA**

MR PETER FENN

**UNIVERSITY OF MANCHESTER INSTITUTE OF
SCIENCE & TECHNOLOGY**



GRAĐEVINSKI INSTITUT

SETTLING DISPUTES ON CONSTRUCTION PROJECTS

1 INTRODUCTION

1.1 The Problem

When two or more parties come together with the objective of producing a building or structure it is inevitable that conflict will arise. Who says so ? Just about everyone; even Dr Johnson linked building and construction with dispute.

To build is to be robbed: Dr Johnson

The plethora of different organisations and personalities required for even the simplest of buildings, together with their varying objectives and goals has resulted in an industry plagued by disputes. Management, organisational and contractual relationships are often criticised as being adversarial and confrontational, resulting in a climate of claims and disputes.

1.2 History of dispute resolution

In the United Kingdom (UK) the traditional arrangement for buying buildings and structures was via an Architect or Masterbuilder controlling craftsmen, journeymen and labourers. The Architect and the workforce made their name by repute. The scope for dispute was limited, formal contracts were few and the contribution of individuals could seldom have a dramatic effect on the overall scheme. The risk of the cost and duration of the construction remained with the client; normally the crown, aristocracy or the church. Nevertheless disputes arose Ferry and Brandon have described how the building of Blenheim Palace almost bankrupted the Duke of Marlborough.

The industrial revolution changed this; building projects became business led and the need arose for risks to be apportioned between the parties to the contract, the client and the builder. A system of main contracting developed, building organisations used their skills to manage labour and materials, at first directly employed but more recently sub-contracted, in a highly competitive tendering market. The result was a fragmented market of poorly qualified firms with the scope for dispute vastly increased, Ball has described the industry as backward not having developed into a mature technically advanced industry.

At the time of the industrial revolution the construction industry split into two distinct parts, civil engineering and building. These two parts have developed very different personalities, procedures and practices; of the two parts building has by far the worst reputation for disputes.

In both parts of the industry a split between the design process and the construction process developed; a single lead professional from the design side took responsibility for the design and acted as the client's agent to supervise the construction process. The architect consolidated his position on the building side and the profession of civil engineer developed to supply the infrastructure for the emerging developments.

2 THE METHODS OF SETTLING DISPUTES

The development of the construction industry brought about a need for methods of settling disputes which arose. Standard forms of contract began to evolve; taking account of the problems most commonly met and providing by contractual conditions a first step to resolution. Since the clients lacked experience in construction their agents were given varying roles as quasi-arbitrators by the contract conditions. The opinion of the architect or engineer is used to decide on contentious matters both within the scope of the contract and often outside. The methods of settling disputes range from litigation through arbitration to these informal techniques.

2.1 Litigation

Litigation is the process of trying, or contesting, a dispute in the courts of law. English law is based on the adversary system developed from the ancient trial by oath or ordeal and by battle; the courts have few powers to investigate issues and make decisions based on the case presented by either side. It is generally accepted that the procedures which have grown up to serve the activities of the courts are not suited to the resolution of disputes or conflicts, other than those of a criminal nature. Joseph has described vividly the failings of the procedures of the courts in civil actions and the advice from practicing lawyers and barristers is:

"Avoid litigation. Do a deal. Shake hands. Forget it. But whatever you do, do not litigate" M. Cook

2.2 Arbitration

The courts were rapidly seen as an inappropriate place for the resolution of disputes which were technical, and perhaps better understood by an expert in construction than the law. A concept of settlement of disputes outside the courts by an expert arbitrator had been developed in the Roman Republic. The industrial revolution saw the development of arbitration as the preferred method of settling disputes in many areas.

Baden-Hellard has described the foundation of the Institute of Arbitrators in 1915 and noted the presence of construction professionals amongst its founders. The construction industry swiftly took on board arbitration as the preferred method of settling disputes. The major advantages were seen to be:

Expert arbitrators;

Speed;

Expense;

In addition arbitration offered the advantage of privacy; proceedings are not recorded or awards published.

Arbitration has several meanings, in law it refers to the process, subject to statutory controls, of handing down an award as the settlement of a dispute; the award is enforceable at law. In England arbitration arises from a contractual, or subsequent joint agreement to refer the agreement to arbitration.

2.3 Informal

The parties to a contract are, of course, at liberty to settle their disputes in any way they see fit. Standard forms of contract contain detailed provision for the settlement of matters which would otherwise be contentious, and the contract administrator is given varying degrees of authority to settle disputes between the Employer and the Contractor.

This is an area where great differences arise between the two parts of the UK construction industry. The standard forms of contract for civil engineering work issued by the Institution of Civil Engineers (ICE), and used on the majority of civil engineering projects, grant the engineer much wider powers than the architect enjoys on building projects. In addition the civil engineering contracts provide for the quasi-arbitration of disputes by the engineer before referral to arbitration proper. An initial study of the frequency of disputes on construction schemes points to the relative rarity of civil engineering disputes; this is shown by the very limited case law on the ICE conditions used for major projects, ICE 5th edition.

3 ALTERNATIVE METHODS OF SETTLING DISPUTES

The dissatisfaction that was felt with litigation is now mirrored by the dissatisfaction felt towards arbitration; the primary advantages of speed and cheapness have all but disappeared. The parties to the contract have looked to alternative methods of settling their disputes. The legalistic solutions of litigation and arbitration are thought inappropriate for modern construction and management methods.

The UK construction professionals have sought alternative methods for settling disputes, and for the first time methods of not merely settling disputes but the intervention of third parties to solve disputes. The alternative method of settling disputes is adjudication, whilst conciliation and mediation offer solutions.

There is evidence that procedures for solving disputes are also being sought elsewhere. Ricketson, Marcus and Marcus, and Thompson have described the approaches in Australia, America and Canada respectively.

3.1 Adjudication

Adjudication has grown as a process similar to arbitration but without the statutory controls on procedure or award. The parties to the dispute normally have a given time to accept the award of the adjudicator and remain contractually bound by the decision for varying periods. The process of adjudication has found great favour in UK standard forms of contract and is used as a method of settling disputes, before recourse to arbitration in:

Joint Contract Tribunal (JCT) forms of sub-contract related to the Standard Form of Building Contract;
The Association of Consulting Architects (ACA) Form of Building Agreement;
The British Property Federation System;
General conditions of Contract for Building and Civil Engineering (GC/Works/1-Edition 3).

3.2 Conciliation

The procedure of conciliation is, erroneously, linked with arbitration in the UK because the body responsible for the settlement of industrial disputes is the Advisory Conciliation and Arbitration Service (ACAS). The process of conciliation has no statutory control nor legal backing to enforce a decision; it does not include the handing down of an award, merely the interposing of a third party between the parties to a dispute to clarify the issues between them.

3.3 Mediation

Again this process has no statutory control or legal backing to any award; the third party intervention attempts to do more than clarify the issues, a solution acceptable to both parties may be found and proposed.

4 CONFLICTION AND DE-CONFLICTION

De Bono put forward proposals for a radical change in world thinking as his solution to east/west conflict. Recent changes in eastern europe have somewhat overtaken his proposals, but his premise remains sound and of considerable interest to the construction industry:

We must replace the dialectic argument system of conflict resolution with a new design idiom; the parties to the dispute are incapable of this and the intervention of a third party is essential.

De Bono noted that the third party might be best drawn from a creative profession; he actually proposed an architect. The logic being that the new design idiom requires a creative individual capable of designing a solution, the track record of the UK construction industry offers no evidence that a UK architect would perform well in this role.

A review of building and civil engineering textbooks in the UK reveals a preponderance of titles on the law and disputes or claims:

Building / construction law
How to avoid or secure claims;
How to evaluate claims;

This is an example of confliction: De Bono's description of the wasted effort expended in creating conflict. On the other hand little exists to help the practitioner solve disputes, deconfliction. There is a need to change the language spoken and attitudes adopted.

CONFLICT

Fight; collision; clashing. OED

A clash of interests, values, actions or directions.

CONFLICTION

The process of setting up, promoting, encouraging or designing conflict.

De Bono uses this word to describe the deliberate process of establishing conflict, and fostering its development.

DE-CONFLICTION

The effort required to evaporate a conflict.

De Bono uses this word to describe the opposite of confliction; the designing away or dissipation of the basis for the conflict.

5 A MODEL FOR THE FUTURE

Conflict resolution is probably the most important area for the future of mankind and the continued existence of the world. Is it good enough to have it served in an inadequate manner

Conflicts: E de Bono

So long as human nature is what it is there will always be disputes. And those disputes, whatever their character, must be resolved - if society is to exist in a civilised way- as quickly, as cheaply, and as satisfactorily as possible.
Alexander Lecture: Lord Justice Roskill 1978

This paper outlines the author's initial research into dispute resolution; an area which creates a great deal of interest amongst UK professionals, it is unclear why this should be so. An undergraduate project on the subject of dispute, supervised by the author, surveyed professional opinion by postal questionnaire; the response rate exceeded 80 %, without the use of pre-paid replies!

The research continues with the immediate aim of identifying the differences in the UK market between civil engineering and building and comparing their performances. It is immediately obvious that civil engineering enjoys the better reputation and has fewer disputes. Why should this be so?

I put forward the following points as my interpretation, which lead into the framework of a model for the future:

1. The relationship between the contractor's engineer and the client's agent (resident engineer). Civil engineering projects generally have two engineers on site, these engineers share a common background and training, this is conducive with an atmosphere of trust and understanding. Building projects do not traditionally enjoy such a relationship; the architect is seldom based on site and his counterpart on the contractor's staff often comes from a different background, until recently a trade background.

2. The UK profession of quantity surveying has until recently made little progress into the field of civil engineering; the functions performed by the quantity surveyor in the building field are traditionally carried out by an engineer on civils projects. In recent years quantity surveyors have begun to make inroads to these areas; this has coincided with an increase in civil engineering case law. There is no evidence to suggest this is a causal relationship but as a chartered surveyor I can pose the question:

Is the quantity surveyor a major cause of conflict on UK building projects?

3. A recent study by the Council for National Academic Awards investigated the education of UK construction professionals and the profile of subjects studied. The time spent on legal studies as a percentage of the whole across a variety of disciplines is shown in Fig 1.

Civil engineers and Architects devote the least time of the disciplines surveyed to the study of the law, yet they are traditionally the contract administrators and the named profession in the major UK standard forms of contract.

The study did not detail the parameters used for defining subject areas, but from my own experience the nature of legal studies is the detailed theory of contract law, tort or delict and litigation. Little attention is paid to arbitration let alone any consideration of the alternative techniques for solving disputes. It is hardly surprising then that the building professions have produced an industry in dispute; the training of the professionals themselves is based on the settlement of disputes by litigation and the professionals are in awe of lawyers who have themselves said:

"Avoid litigation. Do a deal. Shake hands. Forget it. But whatever you do, do not litigate" M. Cook

THE MODEL

Education

The need for a common core area of study for all construction professionals is apparent, the diversity of professions has been noted in the past; this need not be a criticism but the training and education of the different professions must first converge before diverging. The element and content of most courses termed legal studies must be altered to the various methods for both settling and solving disputes.

New profession

Mathurin has described the use of third party experts in both France and Italy. The Italian system of "collaudatore" whereby a professional solves disputes arising during the works and becomes a cosignatory of the written record of the acceptance of the finished building has many good points. There is scope within the UK for further professions, the performance of the industry demands that something is done. The time taken to settle disputes can be extraordinary without the problem being solved; litigation and arbitration may take years. Feigenbaum talks about the speeding up of tasks by order of magnitude, if the "collaudatore" can solve a problem in weeks (or months) which would otherwise run to years of litigation we can see the scope available to the construction industry.

Attitude

The western dialectic argument idiom did not develop in Japan, it would be very bad manners to tell another person that he is wrong, and consequently a much different culture and business attitude has developed. The Japanese construction industry is different than its UK counterpart; Flanagan and Gray tell that many conflicts simply do not arise because of this and have identified the Japanese contractors as a major threat to the UK market.

Whilst not advocating a cultural change overnight, the attitude of non-argument can be usefully employed it is after all simply an extension of the "can do" attitude proposed by many of the new procurement systems recently adopted.

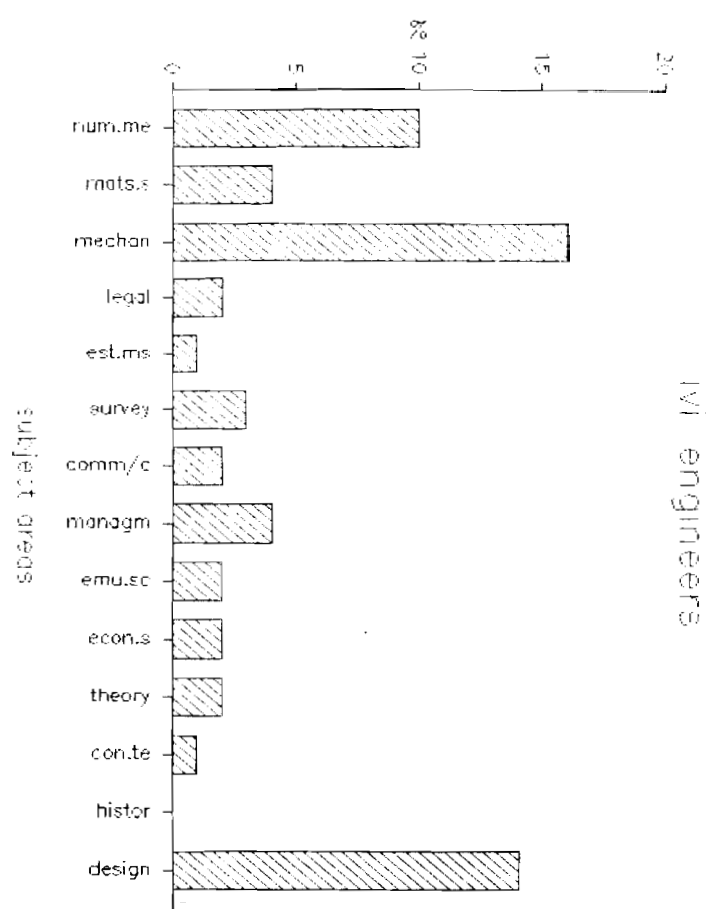
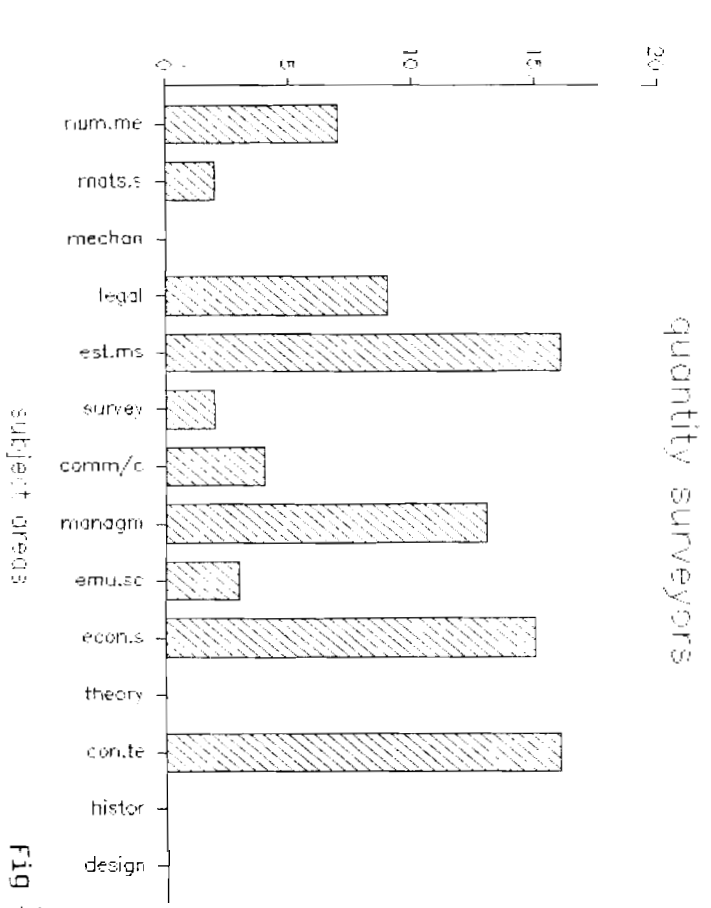
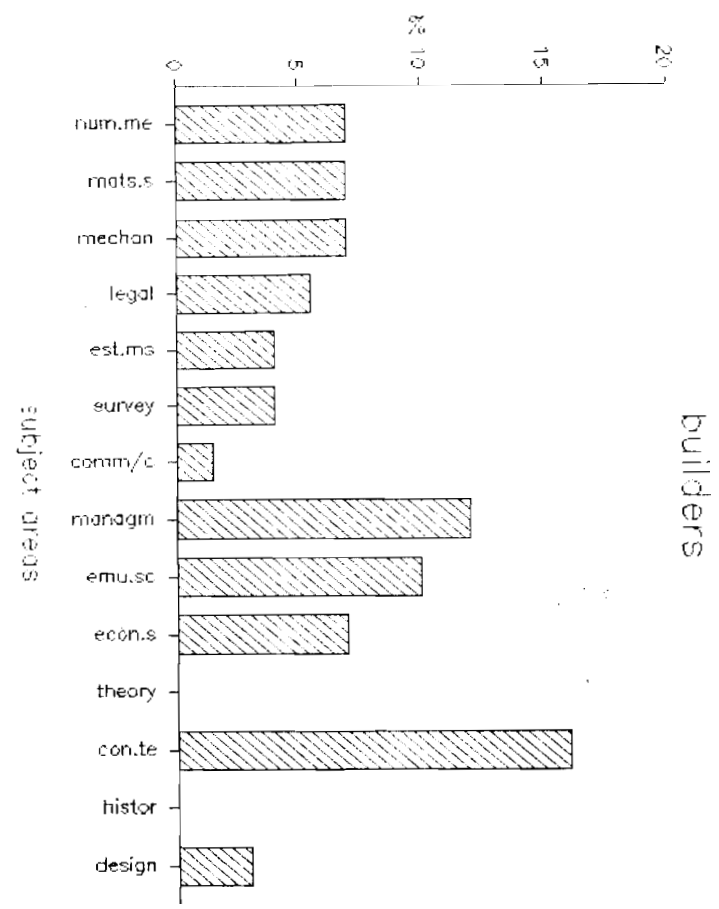
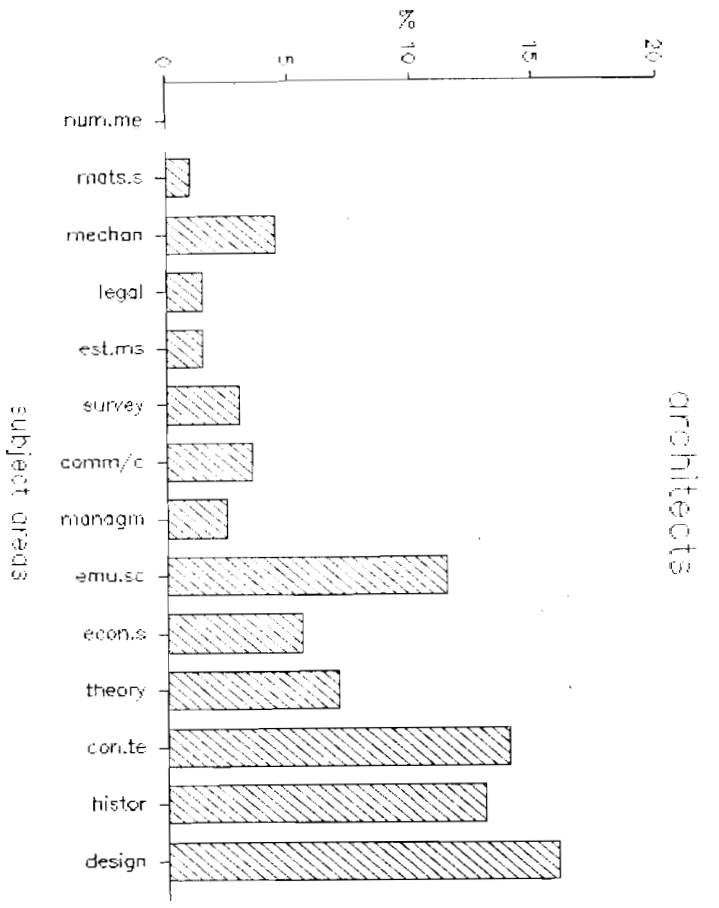


Fig 1

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International Council for Building Research Studies and Documentation

WORKING COMMISSION W92

**PROCUREMENT
SYSTEMS**

**SYMPOSIUM
10. - 13. SEPTEMBER 1990
ZAGREB
YUGOSLAVIA**

**"A GENERAL CLASSIFICATION FOR
THE PROCUREMENT OF
CONSTRUCTION USING THE BASIS
OF FUNCTIONS &
RESPONSIBILITIES &
INVESTIGATING WHETHER THIS
CAN FORM THE BASIS OF A
SINGLE FORM OF CONTRACT"**

BRIAN GREENHALGH

**LIVERPOOL POLYTECHNIC - SCHOOL OF BUILT
ENVIRONMENT**



GRAĐEVINSKI INSTITUT

A general classification for the procurement of construction using the basis of functions and responsibilities and investigating whether this can form the basis of a single generic form of contract.

INTRODUCTION

The traditional procurement system for construction in the United Kingdom has been developed over the last 150 years to a point where all the parties engaged in a construction project have a very definite awareness of their own functions and responsibilities, are reluctant to cross the demarcation lines and require that students of their discipline concentrate on the narrow skills which have tended to make this process self perpetuating. This traditional process can be classified as 'single stage lump sum selective tendering', whereby the design process is fully complete before the builder commences work and indeed tenders for the work are calculated on the basis of a pricing document called a Bill of Quantities produced by the Quantity Surveyor by measurement of the finished design.

This process is therefore a series of end-on activities incorporating the brief, design development, design finalisation, production of tender documents including Bills of Quantities, estimating the tender figure, and finally, the actual construction. Therefore, the work may not be started on site until some considerable time after the initial inception of the project.

This system has worked well because building owners in the U.K. have historically not been sophisticated in construction matters and have traditionally left everything to their professional advisors; and secondly, until relatively recently, clients have not regarded time as being as important as cost and specifically cost certainty.

However, over the last twenty years in the U.K. many more forms of procurement have been developed and used which reflect the relative importance the building owner puts onto:

- (a) Total duration of project
- (b) Cost certainty before construction
- (c) Type of construction
- (d) Single or multi-point responsibility

Many of these procurement systems have been developed by studying the construction industries of North America and continental Europe where building owners have different requirements, the construction professionals have developed along different routes and therefore the procurement processes can differ considerably.

However, a common factor to all construction projects, however procured, is the responsibility for carrying out certain functions and in the main body of the paper this classification by responsibilities shall be used to compare the structure and relative merits and demerits of the different forms of procurement in use in the U.K.

The Conclusion investigates the possibility of a standard form of contract to cover all forms of procurement instead of the disparate family of contracts which now exist alongside many ad-hoc forms.

The responsibilities in construction used in this paper are:

- (i) Financing
- (ii) Design
- (iii) Design Management
- (iv) Construction
- (v) Construction Management
- (vi) Cost Control
- (vii) Supervision
- (viii) Control of Construction

CONSTRUCTION PROCUREMENT SYSTEMS

The 'traditional' (in terms of the U.K. industry) procurement system has operated reasonably successfully for a considerable time, with well defined relationships and responsibilities; it is understood by most clients and they know their financial commitment providing the design has been fully developed at the time of going to tender. The principal designer has time to develop the design without rigorous time or economic constraints and their output is passed to the Quantity Surveyor whose function has developed along this system. The system does allow for subconsultants to design specialist parts of the works but the principal designer still has overall professional responsibility and this conflict has been accentuated by the recent disproportionate increase in the complexity and cost of specialist engineering installations vis-a-vis the building work.

The system also allows for prior consultation with specialist contractors at the design stage and for them to be almost guaranteed the construction work through a contractual process of 'nomination' or 'naming'.

The advantages of this system are:

- (a) Variations are easily incorporated allowing building owners to change work or add/delete work without major financial penalties.
- (b) It is a tried and trusted method and understood by all the parties to construction in the U.K. The form of contract is well understood and the majority of areas have been thoroughly tested in the courts.
- (c) The International form of contract (F.I.D.I.C.) is based on this system.

The disadvantages of this system are:

- (a) The design and all tender documentation must be fully developed before tenders can be prepared and work started on site, although recent developments have incorporated a multi-stage approach.
- (b) End-on design and build arrangement creates a longer total project duration than if organised concurrently.
- (c) Potential for split loyalty of nominated or named sub-contractors.
- (d) 'Them and Us' attitude between consultants and builders.
- (e) Rigid lines of communication, creating low level of flexibility of relationships.

Apportionment of responsibilities

| | | | |
|--------|----------------------------|---|--|
| (i) | Financing | - | Client |
| (ii) | Design | - | Architect |
| (iii) | Design Management | - | Architect |
| (iv) | Construction | - | Main Contractor |
| | | - | Sub-contractors if nominated or named |
| (v) | Construction Management | - | Main Contractor |
| (vi) | Cost Control | - | Consultant Quantity Surveyor |
| (vii) | Supervision | - | Architect |
| (viii) | Control of Construction | - | Architect/Local Authority |

Management Contracting has been used successfully in the U.K. since the 1930's but increased in volume considerably since the mid 1970's when building owners required a much shorter project duration due to the increase in rental levels etc. M.C. now accounts for approximately 12% - 15% of construction industry turnover and is generally the preferred method that British Contractors use when entering a foreign market for the first time, as the contractor does not directly employ site labour.

Work can commence as soon as design proposals are accepted and the control authority permission is granted; however, the packages to be let out to the various specialist contractors need to be agreed at a very early stage in the project since the design must be arranged around these packages, hence the need to involve the management contractor at the inception of the project.

The Management Contractor is generally chosen by competition based on the fee charged (a % of construction costs) and he will also take responsibility for 'Preliminary' items or site based overhead charges. The Work Package contractors are appointed at the second stage of the process i.e. when the design for each package is finalised, by traditional competition using drawings and a pricing document drawn up by the consultant Quantity Surveyor.

The advantages of this system are:

- (a) 'Them and us' attitude reduced and lines of communication improved leading to greater integration of the total construction team.
- (b) Lead-in time for package contractors much shorter than in the traditional system, due to more specialist work and less construction planning required.
- (c) Substantial reduction in the number of variations.
- (d) Total project completion period reduced by overlapping design and construction.

The disadvantages of this system are:

- (a) Total price of work not known until the last package has been let. therefore cost control relies heavily on the estimated costs of total project by the consultant Quantity Surveyor and Management Contractor.
- (b) The Designers have less opportunity to develop the 'whole' design as they are required to release packages at regular intervals.

Apportionment of responsibilities

- | | | | |
|--------|-------------------------|---|---|
| (i) | Financing | - | Client |
| (ii) | Design | - | Architect |
| (iii) | Design Management | - | Usually Management Contractor |
| (iv) | Construction | - | Work Package Contractors |
| (v) | Construction Management | - | Management Contractor |
| (vi) | Cost Control | - | Consultant Quantity Surveyor with Management Contractor |
| (vii) | Supervision | - | Management Contractor |
| (viii) | Control | - | Architect with Local Authority |

The system of **Design and Build** has grown in importance over the last 10 years and now represents over 25% of total construction workload in the U.K. in terms of value. The successful contractor is responsible for both the design function and the construction function, although a firm of design professionals may be given a 'watching brief' by the client.

As one firm (the contractor) has responsibility for design, construction planning and organization and control, this allows the activities to proceed concurrently to a greater extent than if several firms were involved, and with much more integration. However, if relationships do sour then it may cause a major problem. The design and build system has been found to be suitable for most types of building, unlike other forms of procurement which tend to be more efficient under certain conditions.

The advantages of this system are:

- (a) Single point responsibility, The client has direct contact with the contractor, thus improving the lines of communication, flexibility and response rate to potential variations.
- (b) Total construction duration is substantially shorter than in the traditional system.

- (c) Because the designer is part of the construction firm, he is more likely to be sympathetic to construction problems and the builders requirements from the design, therefore, the potential number of variations will be reduced.

The disadvantages of this system are:

- (a) Lack of stimulus for design innovation.
- (b) High costs incurred in tendering, which are obviously passed on to building owner. Contractors reluctant to tender if there are more than three competitors.

Apportionment of responsibilities

| | | | |
|--------|-------------------------|---|---------------------------------|
| (i) | Financing | - | Client |
| (ii) | Design | - | Contractor |
| (iii) | Design Management | - | Contractor |
| (iv) | Construction | - | Contractor |
| (v) | Construction Management | - | Contractor |
| (vi) | Cost Control | - | Contractor with C.Q.S. |
| (vii) | Supervision | - | Contractor |
| (viii) | Control of Construction | - | Contractor with local Authority |

In the **Construction Management** or **Separate contracts** system the Client enters into contract with Work Package Contractors, one of whom will be responsible for the construction management, and tends to be used predominantly for 'fast-track' construction of multi-million pound prestige office complexes in high capital value areas such as central London.

As time is generally the most important criteria, contracts are let on bills of approximate quantities or schedules of rates as a pricing document with an outline specification. Thus the clients financial commitments are not as easily assessable at tender stage. However, this lack of formality in documentation is outweighed by greater contact between designer and tradesmen, higher motivation and quality control, although when disputes do occur, these may present greater difficulties.

The advantages of this system are:

- (a) Lines of communication between designer and tradesmen are shorter.
- (b) Overall project duration is substantially shortened due to overlap of design and construction.
- (c) 'Post Contract' control more specialised and tighter therefore project performance more likely to be high.

The disadvantages of this system are:

- (a) Total price of work not known until the last package has been let. Therefore cost control relies heavily on the estimated costs of total project by the consultant Quantity Surveyor.
- (b) The Designers have less opportunity to develop the 'whole' design as they are required to release packages at regular intervals.

Apportionment of responsibilities

| | | | |
|--------|-------------------------|---|--|
| (i) | Financing | - | Client |
| (ii) | Design | - | Design Package |
| (iii) | Design Management | - | Management Package |
| (iv) | Construction | - | Work Packages |
| (v) | Construction Management | - | Management Package |
| (vi) | Cost Control | - | Quantity Surveyor (advisor to client) |
| (vii) | Supervision | - | Management Package |
| (viii) | Control | - | Local Authority |

The **Project Management** procurement system became more popular in the U.K. during the 1970's and 1980's due to building owner dissatisfaction with delays and excessive costs of the more traditional systems. The project manager is, to all intents and purposes, the client; and as a professional with expertise in the construction industry can interface between the client's requirements and the industry's organization. The project manager must act as the leader of the project from inception, feasibility, design development, and tender through to the construction phase and final account.

The Project Manager is responsible for the overall project planning and control of the works and has the option of a separate contracts system or the traditional arrangement with a main contractor, with the advantages and disadvantages mentioned previously.

The system intends to provide the advantages of the traditional system, which is understood by the majority of building owners, with improved management and communications methods.

The disadvantages of this system are:

- (a) The Project Manager is responsible for all the design and management functions, although he may only be technically skilled in one or two.
- (b) Lines of communication all emanate from one source, therefore creating potential bottlenecks.

The advantages of this system are:

- (a) There should be an overall reduction in project duration and reduced cost overrun due to the improved management methods and overlap of design and construction.
- (b) The design and construction functions are separated and both are of equal weighting under the P.M.
- (c) Single point responsibility, the client has direct contact with the project manager, thus improving the lines of communication, flexibility and response rate to potential variations.

Apportionment of responsibilities

| | | | |
|-------|-------------------|---|--------------------|
| (i) | Financing | - | Client |
| (ii) | Design | - | Architect/Engineer |
| (iii) | Design Management | - | Project Manager |

| | | | |
|--------|----------------------------|---|---|
| (iv) | Construction | - | Main Contractor or Work Packages |
| (v) | Construction Management | - | Project Manager or Main Contractor |
| (vi) | Cost Control | - | Project Manager with Quantity Surveyor |
| (vii) | Supervision | - | Project Manager |
| (viii) | Control | - | Local Authority |

The **British Property Federation** system of organising construction was designed by a client organization, and therefore lacks the compromises of other forms of contract as it is concerned primarily with the client's interests. The system was designed to change attitudes and alter ways in which the disciplines dealt with each other by removing overlap of function by attempting to redefine risk and create awareness of time wasting and costly practices which obstruct progress towards completion.

A 'Client's Representative' manages the project and does not involve himself in either the design or construction, but concentrates on the management of the process. A 'Design leader' is responsible for the pre-tender design and for sanctioning the contractor's final design since contractors tender on a partially complete design, and are themselves responsible for completing the design, which can take account of their own particular specializations.

The advantages of this system are:

- (a) Adjudicator is appointed to decide issues promptly.
- (b) Financial incentives are provided within the contract to encourage contractors to design economically.
- (c) 'Priced Schedule of Activities' preferred pricing document to Bills of Quantities.

The disadvantages of this system are:

- (a) Weighted heavily in favour of the building owner.
- (b) Little usage so far, therefore reluctance of advisors to recommend it to clients.

Apportionment of responsibilities

| | | | |
|--------|----------------------------|---|-----------------------------------|
| (i) | Financing | - | Client |
| (ii) | Design | - | Design Leader/ Contractor |
| (iii) | Design Management | - | Client's Representative |
| (iv) | Construction | - | Main Contractor |
| (v) | Construction Management | - | Main Contractor |
| (vi) | Cost Control | - | Quantity Surveyor |
| (vii) | Supervision | - | Main Contractor |
| (viii) | Control | - | Design Leader/ Local Authority |

CONCLUSIONS

All construction works, in whatever country and under whatever procurement system have the same basic list of responsibilities and functions, which are listed in the introduction to this paper. The construction professionals of the various European countries have developed their specializations along quite different lines depending on the requirements and nature of their indigenous industries. However, this list of responsibilities can be used to determine the extent of the input of project participants as well as the risks which each participant bears.

This classification is therefore very useful, not only in defining guarantees and insurances as proposed by M. Claude Mathurin (2) but also in developing a single generic form of construction contract for use on an inter- and intra-national basis; which defines the relationships and roles of the project participants, thus also defining the project organisational structure which must be flexible enough to work within the legal framework of an individual country.

There is substantial room for further research in this area.

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**WORKING COMMISSION W92
PROCUREMENT
SYSTEMS**

**SYMPOSIUM
10. - 13. SEPTEMBER 1990
ZAGREB
YUGOSLAVIA**

**"A REVIEW OF UNITED KINGDOM
PROJECT
PROCUREMENT METHODS"**

NICHOLAS HAMILTON

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GRAĐEVINSKI INSTITUT

"A REVIEW OF UK PROJECT PROCUREMENT METHODS"

INTRODUCTION.

The final two decades of the twentieth century will be seen by future historians as a time of considerable change and turmoil in UK construction project procurement. In comparison to the early and middle decades there is no doubt that the options open to a promoter of a construction project are now more varied. However it would be a mistake to assume that the relatively settled years of the twentieth century were the end of an era that stretched back into far history. Twentieth century UK project procurement has been characterised by what we now tend to call the 'traditional' process in which building clients used the architectural profession as advisor and representative. However this was not always the way that buildings came to be built.

Previous centuries saw the great promoter/constructors like Wren and Nash who were responsible for the inception and execution of the project. They led all aspects of the process and employed individuals workers and groups of workers as and when necessary. The main contractor did not exist in those days. It was the decline of the master craftsman coupled with the increased emphasis on time and budget that forced promoters of projects to seek a different approach and devolve responsibility for the procurement of a building. The early decades of the twentieth century saw the rise of the main contractor, the establishment of the construction professions in a form that we recognise today and the ascendancy of the 'traditional' form of project procurement. The rise in the 1970s and 1980s of alternative approaches to project procurement are many and complex. There are a number of reasons why these changes have occurred at this time.

The ascendancy of aggressive money markets has put pressure on clients and investors in capital projects. Buildings that are expected to earn a rapid return on the initial investment are a particularly good example of where the traditional procurement route was seen by clients as cumbersome and incapable of providing the necessary flexibility.

The increasing complexity of modern buildings has put pressure on designers to the extent that the wide variety of skills needed to design a building cannot be encompassed by an individual or a small group of individuals. A number of different organisations are needed resulting in a dilemma regarding the co-ordination and control of the design process. An architectural practice that at one time was capable of designing and controlling construction on behalf of the client now finds itself hard pressed to do so.

The decline of standards of craftsmanship has resulted in the increased use of factory made components and pre-fabricated parts for buildings and the use of specialist to manufacture and fit them. As the number of trade and craft specialist has increased the Client and his representative have been confronted by a growing co-ordination problem to the extent that the main contractor is sometimes seen as a barrier to effective project progress rather than an essential part.

A REVIEW OF CURRENT UK PROCUREMENT METHODS.

By nature a review is bound to classify methods and try to place them in some sort of order with the result that there is a danger that an impression of boundaries between systems is given. It is probably more helpful to consider the range of methods described here as points on a continuum with the boundaries between the systems blurred to the extent that they are not distinguishable. This blurring is created by the number of hi-bred methods of procurement that exist within the range described here. Figure 1. illustrates the concept with methods that feature a significant degree of client

involvement with actual construction work towards the right. Methods that feature a low level of client involvement in site activities tend towards the left of the model.

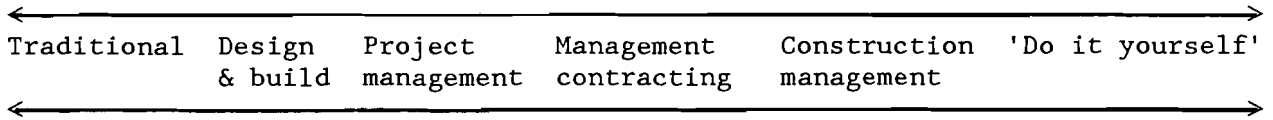


Figure 1. The project procurement continuum.

The main characteristics of each procurement system featured in Figure 1 are described in the following sections.

1. The traditional method.

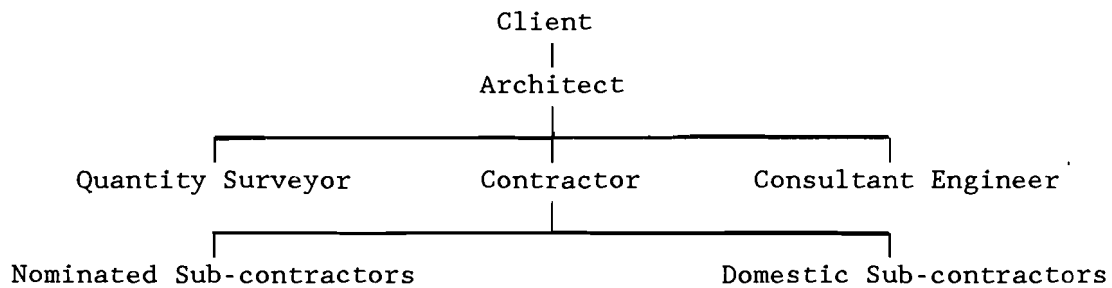


Figure 2. The traditional method.

Figure 2 shows the main features of the system in graphical form and highlights the key relationships involved. Although it might seem unnecessary to include details of such a familiar system it is shown so that comparison with other methods displayed in the same style can be made.

2. The design and construct method.

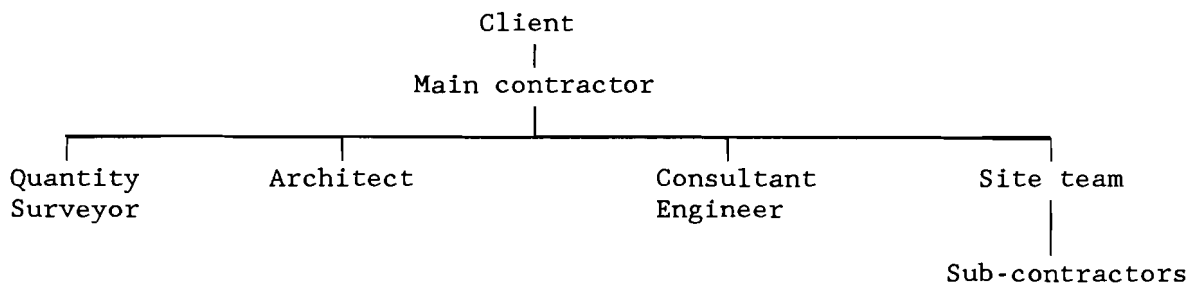


Figure 3. The design and construct method.

This system evolved from the view amongst contractors that they could supply a complete service to a certain type of client/promoter. The type of client targetted was one that had little expertise in procuring a building or structure, had limited interest in becoming involved with the detail of the design or construction process and had speed of construction as a major consideration. A number of major UK contractors have made a point of addressing the design and build concept to the extent that companies have been

created within a group with the sole purpose of exploiting the market. The Quantity Surveying division of the Royal Institute of Chartered Surveyors recently carried out a survey of the design and construct system. Their conclusion was that it could be:

"A cost effective way of procuring a building, particularly where speed of construction is important."

It might be imagined that the architectural profession would be alarmed at contractors taking over their traditional role. No doubt there are individuals within the profession that have misgivings about the trend but the official view from the Royal Institute of British Architects is more positive. The RIBA President was recently quoted as saying:

"We accept that design and construct is here to stay. Any inference that we are anything other than happy is misleading.....It is always possible for the Architect to lead the design and construct team.....Under the new RIBA rules we are allowed to operate as limited companies and act as developers. If an Architect sees a design and construct tender why not go for it".

3. The project management method.

Project management should be regarded as a distinct procurement system with particular unique features. The client employs an organisation to carry out all the necessary functions to procure a building. The project manager is invested by the client with all necessary powers to achieve that aim. True project management is where the project manager has the power to make strategic and economic decisions on behalf of the client without continual recourse to client approval. The degree to which the project manager can commit client resources to the project varies but if this power is severely limited it can be argued that the process is not really project management at all but some other system.

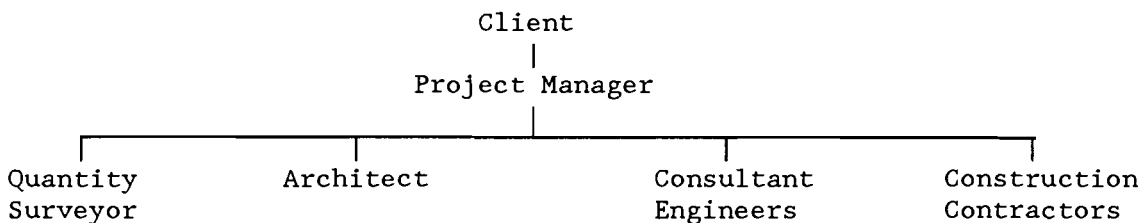


Figure 4. The project management method.

The role of project manager can be adopted by a number of different types of organisation. In recent years a number of 'project management' companies have sprung up committed to providing a complete project procurement service to potential clients. The personnel who populate these organisations come from a wide variety of construction disciplines with architects, quantity surveyors and construction managers featuring strongly in their ranks.

Project management has rapidly gained credibility in the UK as a system appropriate to a wide variety of clients. The client who chooses not to become closely involved in the procurement process may be attracted to it because of the single point of contact through the project manager. Another client who has an interest but not the resources to become closely involved may be attracted for the same reason.

4. The management contracting method.

Some authorities use the term management contracting as a general term to describe any procurement method where emphasis is placed on the management of the design and/or construction process. However this use of the term is not wholly satisfactory because used in this way it blurs the differences between the two main methods it encompasses and fails to highlight the major distinctions between them.

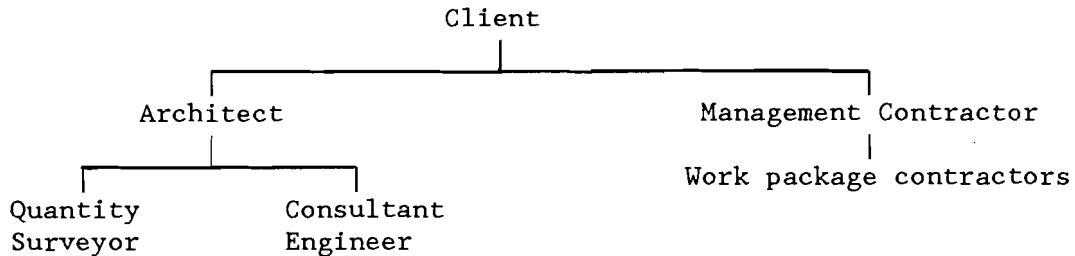


Figure 5. The management contracting method.

Management contracting is a system where an organisation, usually a company that would in different circumstances be called a main contractor, manages the construction process on behalf of the client. This organisation, which may conveniently be called the management contractor, does not employ direct labour but sub-contracts out all the construction activities to work package contractors. The most important feature from the point of view of distinguishing this method from the following one is that the management contractor holds the sub-contracts, not the client.

The first notable example of management contracting in the UK was the during the late nineteen sixties but it was the late nineteen seventies before the method became popular. In the early years the system worked well with both client and management contractor committed to a non-confrontational style of working and determined to break the mould of traditional construction processes. In recent years the system has been less successful due principally to a change in the construction climate. The conditions of contract have become more complex and moved nearer to the confrontational style that earlier versions had sought to avoid. The management contractors in the early years had a commitment to making the system work but this commitment is absent from many of the contractors that have moved into management contracting in recent years. The claims conscious contractor of the eighties has given management contracting a bad name and many clients now view the system as flawed. A recent comment by the construction director of one of the UK's largest property developers sums up the current thinking in many client organisations.

"Management contracting has all the disadvantages of other forms of contract and none of the advantages".

Disillusionment with management contracting is not only confined to client organisations. Organisations that take the role of work package contractors to the management contractor are also unhappy with the system as it now operates. The vice-president of one of the country's leading product bodies is

recently quoted as saying

"Management contracting is appallingly bad. It has nothing to recommend it".

The lack of direct control by the client over the work package contractors is seen as the major problem with the management contracting method. The difficulties stems from the nature of many clients who see the system as a solution to the inadequacies of the 'traditional' method. Such clients expect to be more closely involved with the construction process by adopting management contracting and assume at the outset that they will be able to exercise greater control over the process than would have been possible under the traditional method. They are disappointed to discover that this is not the case and the presence of the management contractor represents a similar sort of barrier between themselves and the work package contractors as the architect had done in the traditional system. The client's wish to become more closely involved with the construction process is therefore frustrated leading to friction and disillusionment.

5. The construction management method.

This method is the other system of project procurement that is sometimes put under the umbrella of management contracting. The argument for not adopting this approach is clear when the major difference between management contracting and construction management is appreciated. This difference lies in the relationships between the client, the manager of the construction process and the work package contractors.

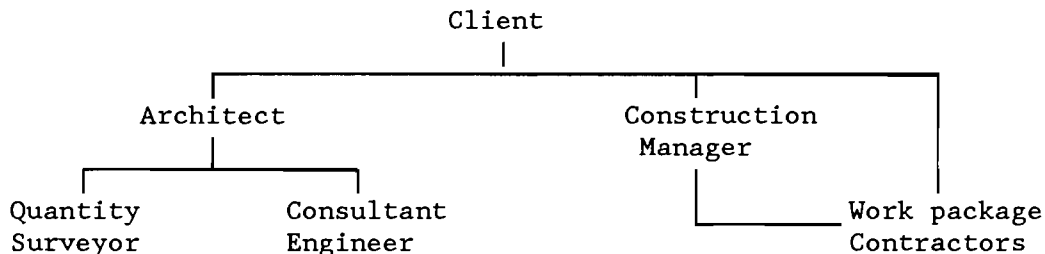


Figure 6. The construction management method.

The construction manager is employed by the client as a specialist consultant in the same way that the client employs an architect to carry out the design function. The most important feature of the system and the feature that distinguishes it from management contracting is that the client holds the sub-contracts with the work package contractors not the construction manager. The construction manager is employed to oversee construction activities on site but the client has a much closer involvement with progress than is the case with management contracting. This close involvement provides the 'right type of client' with the project environment that is missing from management contracting. The client can directly influence site activities. The term 'right type of client' is particularly important in this context because clients adopting this active role in the construction process must be able to fulfill it adequately or face considerable problems. The right type of client is one that is knowledgeable about the construction process, is willing and able to provide expertise to fulfill its obligations and has a strong interest in the process for its own sake in addition to the nature of the final outcome.

There are a number of notable examples of construction management in action in the UK over recent years. Probably the best documented example is that of the Broadgate development in central London. The fourteen phases of the project are now nearly complete and it provides an excellent example of construction management. The organisational arrangement for phases one to four are shown in Figure 7. Phases five to fourteen had a number of changes but the construction management pattern is essentially the same.

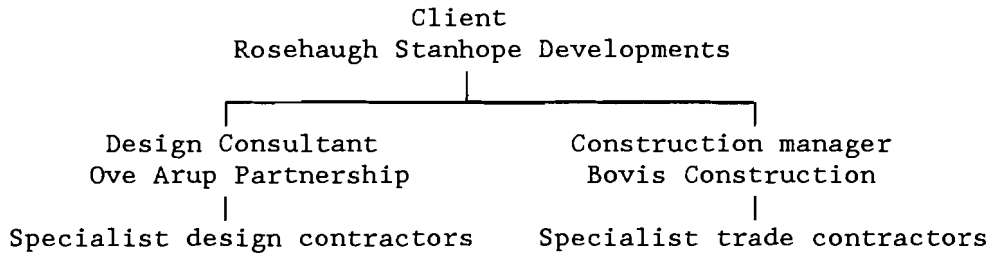


Figure 7. Organisational structure. Broadgate. Phases 1 - 4.

The most notable feature of the Broadgate project is the nature and role of the client Rosehaugh Stanhope Developments. Leading figures within RSD had a close interest in the construction industry, they were knowledgeable about construction processes, had a wish to see the industry improve its performance and of course they had an intense interest in the final product from both an economic and aesthetic point of view. Such an organisation, dissatisfied with the performance of the industry in the past, is the epitome of the successful construction management client.

6. The 'do it yourself' method.

There are a small number of projects currently in progress in the UK that fall into this somewhat frivolously named category. The method has been adopted by some property developers who have become dissatisfied with the service provided by the UK construction industry and feel they have the expertise and will to bypass it almost completely. The term 'do it yourself' stems from the direct involvement with the site activities that the property developer adopts.

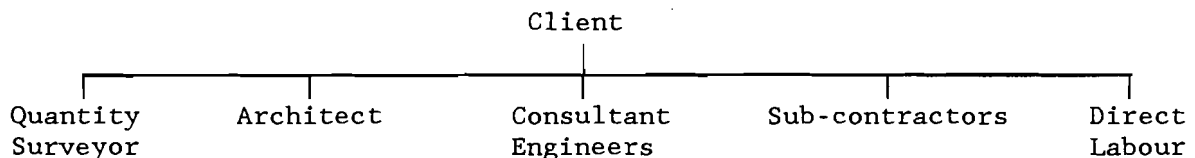


Figure 8. The 'do it yourself' method.

In essence the developer becomes a contractor for the duration of the project using its own directly employed managers and supervisors to run the project, employing work package contractors and direct labour operatives. The expertise to do this comes from within the property developer's own organisation or is hired in for the project. There are no intermediate organisations such as project managers or construction managers involved. Obviously it takes a special sort of company with experience of the construction process to adopt

this route to procurement. Only a few organisations outside the mainstream of construction would be in a position to do it effectively which is why the system is not well known and relatively undocumented.

THE FUTURE DIRECTION OF UK PROJECT PROCUREMENT.

The pattern of change that is underway at the moment in the area of UK project procurement seems likely to continue for the foreseeable future. A number of factors can be identified to support this view.

Clients have seen the benefits of adopting different strategies in response to different procurement situations. They are also becoming aware that their own client organisations have different strengths and weaknesses and that no one method of procurement is universally appropriate. Despite its rather frivolous title the 'do it yourself' method shown in Figure 8 represents the latest event in the client body investigating alternatives to previous approaches to project procurement.

The various groups that make up the industry do not see the present range of project procurement systems as complete. Architects, engineers, quantity surveyors and contractors know that the client body is not yet fully satisfied with the service offered by the industry and that by pursuing alternative procurement methods the industry might be able to offer a service more attuned to the needs of clients. As a result of this there are likely to be more variations on the basic range of procurement systems in the future.

The growing attraction of some procurement systems at the expense of others is inevitably going to continue. Management contracting is seen by some clients as the right way for them to proceed but more and more are of the opinion that the disadvantages of the system outweigh the advantages and that if they wish to have a 'hands on' approach to the construction process then construction management is the way ahead. The traditional approach to project procurement is for the foreseeable future going to be attractive to a certain type of client who see the architect as the right person to represent their interests in the procurement process. However the alternatives now available will undoubtedly reduce the number of clients who seek this method.

The changing nature of the political, financial and cultural institutions of Europe will have an effect on the way clients in the UK look at procurement. The way other countries go about the process will become more apparent as frontiers become less significant and European trade increases. The harmonisation of methods and standards within the EEC can only increase this trend together with accelerating trade with eastern Europe.

The attitudes of the professions within the UK construction industry must be considered in relation to the changing nature of procurement. The architectural profession, for a while considered the dinosaur of the industry is now awakening to the loss of its traditional role as the client's representative and taking steps to recoup some of its lost ground. Architects moving aggressively into project management is just one example of the newly found confidence of the profession. Quantity surveyors were quick to see that their traditional role in measurement was unlikely to sustain the profession in the face of technological change. They rapidly moved into other spheres of construction activity suited to their legal and financial expertise and have now firmly established themselves in project management. They are keen to consolidate their new position and will in the future be active in pursuing every opportunity to further the role of the QS. Additional involvement in

procurement is one of the strategies they will use to achieve this end together with an active pursuit of new methods that fulfill the requirements of their clients.

This paper has reviewed the project procurement systems currently in use in the UK and has suggested why the changes that have occurred during the last two decades will be sustained into the next century. It is hoped that this review will have clarified the current position in the UK, given food for thought to those who know the UK construction scene, and provided an insight to those who are just coming into contact with western construction methods for the first time.

Nicholas Hamilton.

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International Council for Building Research Studies and Documentation

WORKING COMMISSION W92

**PROCUREMENT
SYSTEMS**

**"DESIGNING FLEXIBLE
PROCUREMENT SYSTEMS"**

**SYMPOSIUM
10. - 13. SEPTEMBER 1990
ZAGREB
YUGOSLAVIA**

WILLIAM HUGHES

**DEPARTMENT OF CONSTRUCTION
MANAGEMENT - UNIVERSITY OF READING**



GRAĐEVINSKI INSTITUT

DESIGNING FLEXIBLE PROCUREMENT SYSTEMS

This paper is about organizational structure in construction projects. An organization is a collection of people who join together in some formal association in order to achieve group or individual objectives (Dawson, 1986). Organizational structure is the set of roles which these people take on, and the relationships between them. Within the context of the procurement of construction projects, it is useful to add to this definition the dynamic of decision-making. Decisions mark "pinch-points" in the process, and split the work into packages. The combination of roles, responsibilities and relationships, interspersed at various points in time by decision points, is the framework which defines the procurement of a building. Therefore, the phrase "procurement method" becomes synonymous with the phrase "organizational structure of construction projects".

1 PROBLEMS IN THE ORGANIZATION OF CONSTRUCTION PROJECTS

There has for some time been an impression that construction projects suffer from inappropriately defined organizational structure (Carpenter, 1981). This is despite the clear evidence that the industry is well able to cope with flexibility in terms of organizational structure. Witness, for example, the emergence of "standard" procurement patterns such as Design & Build, Management Contracting, Construction Management, etc. some of which have only really become popular in recent years, and have been rapidly adopted by many different firms as the solution to their organizational problems.

1.1 Tailoring procurement systems

Text books on construction management are increasingly stressing the need for organizational structures to be tailored to meet particular project needs (Barrie & Paulson, 1978; Burgess, 1979; Walker, 1984; Bennett, 1985). This underlines the nature of the problem; although it is clear that procurement systems need to be adaptive and flexible, there is a shortage of techniques available with which to analyse project demands, and model the requirements of the construction project organization. Because of this shortage, far from tailoring individual project organizations to suit the demands of the particular project, the industry is moving increasingly towards the idea of offering a limited range of specific procurement options.

These options often do not satisfy the requirements of the clients of the construction industry. This is partly due to the lack of analytical tools with which to analyse the environment and to design appropriate temporary organizations. It is also because the roles of professionals have been defined from the point of view of each profession, rather than the needs of the project as a whole.

In practice, then, the construction industry falls into the trap of categorizing and classifying procurement methods to such an extent that people develop their own particular favourite methods of organization which they stick to. There seems to be a tendency to repeat the same techniques over and over again, despite the basically transient and unique nature of the product. This leads to the situation described by Carpenter (1981) where "projects go wrong because the actual tasks peculiar to the project are not identified.

This failure prevents appropriate procedures being developed for the project." Similarly, Neale (1984) comments that "it is not unusual to find well qualified and competent people who have become powerless prisoners of ill-conceived management structures and control procedures". This may imply that practitioners assume that there is one solution to all management problems, just waiting to be found. However, there are clear indications that there is a trend towards recognizing the need for appropriate management structures (Sidwell, 1982; Finniston, 1986). It is apparent that the industry can accept different organizational forms for different projects, because there are significant differences between types of contract.

1.2 Choosing procurement systems

Although most projects are let on the basis of a particular procurement path, the range of these options is increasing. Because of this a variety of approaches exist to choose between procurement methods. If a client is in the situation where they can only select between a limited range of options, then these techniques may be of some use. However, the purpose of this paper is to show how procurement systems should be designed so that the actual tasks and responsibilities peculiar to a given project can be identified.

1.3 Designing procurement systems

The systems used for the procurement of buildings are organizational systems. They involve people in a series of strategic decisions, and a pattern of roles, responsibilities and relationships which combine to form the organizational structure of the project. Research has shown that in order to ensure effectiveness of the building team, this organizational structure needs to be contingent upon the environment within which the construction project takes place (Hughes, 1989). In addition, a changing environment means that the organizational structure needs to be responsive, and dynamic. These needs are often not satisfied in the construction industry, due to the lack of analytical tools with which to analyse the environment and to design appropriate temporary organizations. Two useful techniques have been developed to aid project teams in these tasks. They are Environmental Complexity Analysis, and 3R Analysis.

It is clear that all projects pass through similar stages in their development. An analysis of the various published plans of work shows that the basic set of stages can be described as Inception, Brief, Scheme design, Detail design, Contract, Construction and Commissioning (Hughes, 1989). These stages are characteristic of construction projects, and in theory each stage should be punctuated by a decision by the client's organization about whether to proceed to the next stage. These decision points provide the client with an opportunity for control and feedback at a broad level. It is the work between these decision points that will vary from project to project. This is the task of the organizational designer; to identify the objectives of the project, and to define the decisions, activities and roles and responsibilities within the stages in advance, so that the project may meet the client's requirements.

The first step in this approach is to analyse the environment within which the project is taking place.

2 ENVIRONMENTAL COMPLEXITY ANALYSIS

Analysing the environmental complexity identifies the key variables in the environment which affect the construction project, and which should be affected by the project. These are classified at two levels of Macro-environment and Micro-environment. The variables at the level of Macro-environment fall into the categories of Economic, Social, Cultural, Physical and Political. These aspects are large scale, and most of them are not directly impinging on a project, except insofar as they affect a project's Micro-environment. The Micro-environmental factors are defined as Financial, Legal, Technological, Aesthetic and Policy constraints. Their identification will do two things. First, it will set the parameters within which the project has to be managed, and secondly it will identify the effect which it is intended that the project will have upon the environment. Clearly, if a construction project is going to have any viability at all, then it must affect some or all of the Micro-environmental factors.

The qualitative aspect of this approach is to describe the environment under each of the headings, in terms of what exists at the beginning of the project, and the intentions and predictions about what ought to exist at its end. This analysis of the environment provides a clear basis for framing the objectives of the project, and therefore should form the basis for the planning and control of the project. In order to ensure that the project is adequately managed from the client's point of view, and in order to maintain frequent and regular contact with progress on the project, the client needs to understand and define the relevant control systems for the project.

Control can be seen as the interface between work on the project, and the Micro-environment of the client's activities. Therefore, it is essential that the control systems are sufficient for the level of control demanded of them. Because of this, it is necessary to look at control as a function of the demands placed upon the project by the Micro-environment. Thus, control needs to be effected in five ways, each matching a different aspect of the Micro-environment. These five control systems are Budgetary, Contractual, Functional, Quality and Time control respectively. Although each has a focus of concern within the Micro-environment, it is clear that the relationships are multiple and interdependent. However, it is useful to model them in the juxtapositions shown in figure 1.

This provides a basis for the project managers to define the organizational structure which will be required for the project. This is based on a fundamental systems model of work, which relates activities, decisions and control to each other, as in figure 2.

3 STEPS IN THE DESIGN OF A PROJECT'S ORGANIZATIONAL STRUCTURE

The second technique introduced is the technique of "3R analysis", based on a graphical technique for describing and modelling Roles, Responsibilities and Relationships.

In order to be able to describe the requirements for the project in terms of Roles, Responsibilities and Relationships, a series of steps need to be followed so that they can be properly identified.

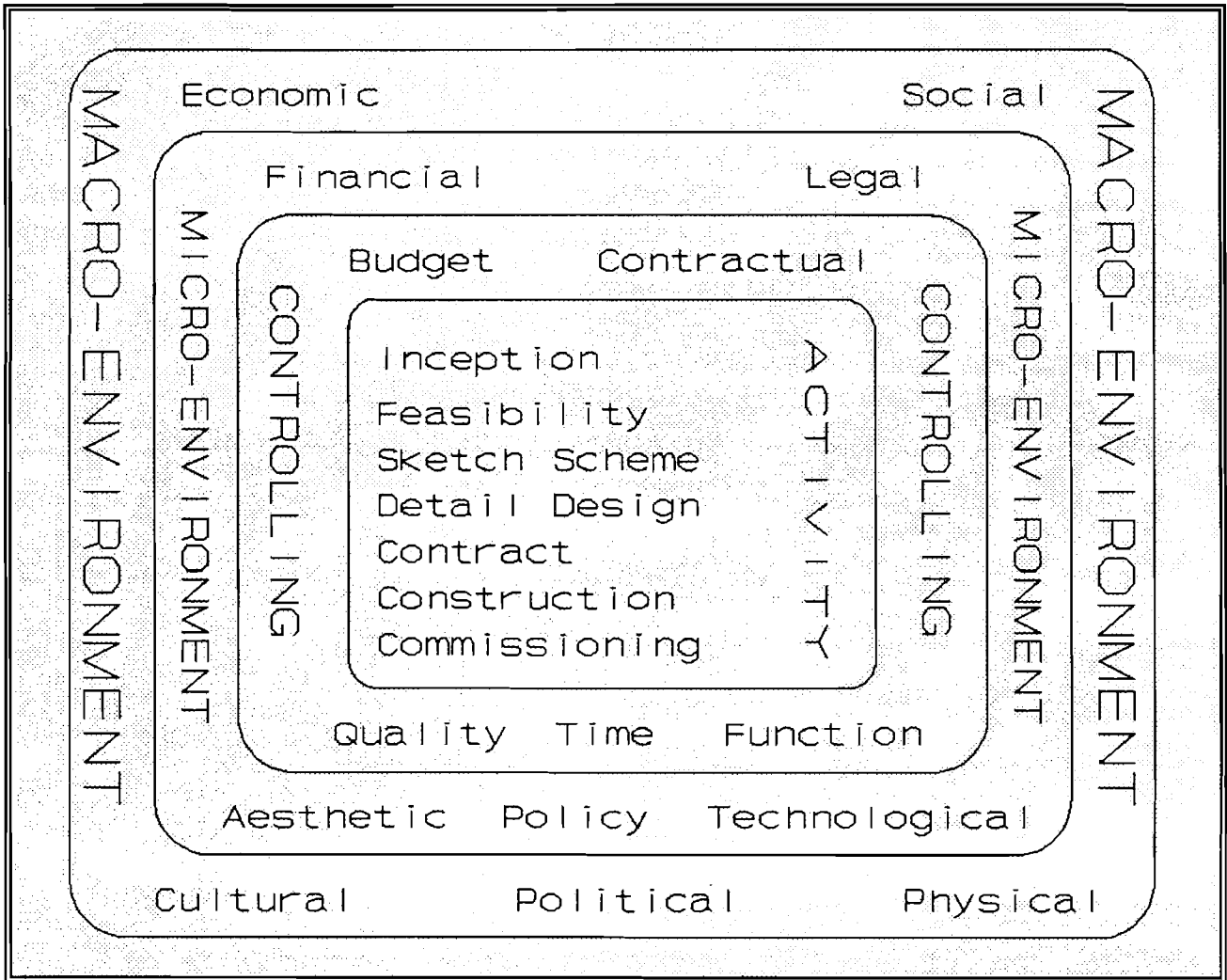


Figure 1: Environmental influences on construction projects

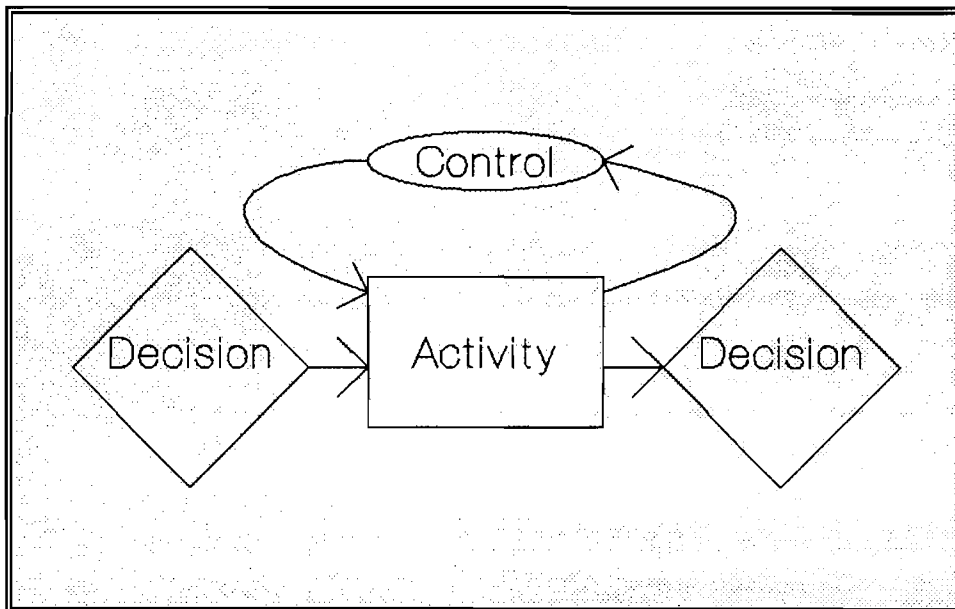


Figure 2: The context of activity

3.1 Objectives

The definition of objectives is the single most important part of the process. There must be a clear statement, understood by all of the contributors to the project, about exactly what is intended by the project. Without this, the problem-solving activities of the project team will be mis-directed and will require constant reference to the client. When the objectives are stated in terms that are understood and accepted by all members of the project team, the work can progress economically and efficiently because contributors can predict the client's reaction to different solutions. This helps to get things right the first time, instead of having to repeatedly revise earlier decisions in the project.

The Macro-environment of a project will usually be fairly stable, but the project management team need to ensure that they are fully aware of the Macro-environmental factors. Failure to do this can result in conflict between members of the project team. The client has to analyse the Micro-environment of the project in order to correctly set up the objectives of the project. What the project team need to know are the relative priorities of the client, for each of these factors. For example, the financial environment will dictate the budget for the project, and the aesthetic environment will dictate the quality and appearance required of the project. When a trade-off has to be made between these two aspects, which of them is more important? At what point in the life of the project do these priorities change, if at all? Similar questions need to be posed about the contractual, time and functional requirements of the project. The objectives of the project, arising from an environmental analysis, set the framework for all decisions, control systems and planning of the project.

The abstract model showing the relationships between levels of decision, stages of work, activities and operations is in figure 3. This demonstrates how the basic model from figure 2 works at several different levels. These levels are defined in subsequent paragraphs.

3.2 Policy decisions

The most important project decisions are called Policy Decisions. They trigger and terminate the process of building procurement. At their simplest level they can be defined as (a) the decision that a new building is required, and (b) the decision that it has been supplied, in an acceptable state, and that all related contractual obligations are discharged.

The explicit definition of these decision points provides two important features for the project team. The initial policy decision should encompass all of the prioritized objectives and fully documented evidence of their origin. This sets the scene for the rest of the project and provides a basis against which all future decisions can be compared. Clearly, the documentation must be regularly reviewed and updated to reflect the changing situation throughout the project; otherwise it will be useless as a control mechanism. The second feature is furnished by the early, explicit definition of the final policy decision point. This enables the project team to be clear about the extent and duration of their involvement. In a project based industry, people at all levels need clear guidelines on the start and finish points of their involvement with projects, to aid their own corporate planning and marketing activities to take place within a reasonably well-informed context.

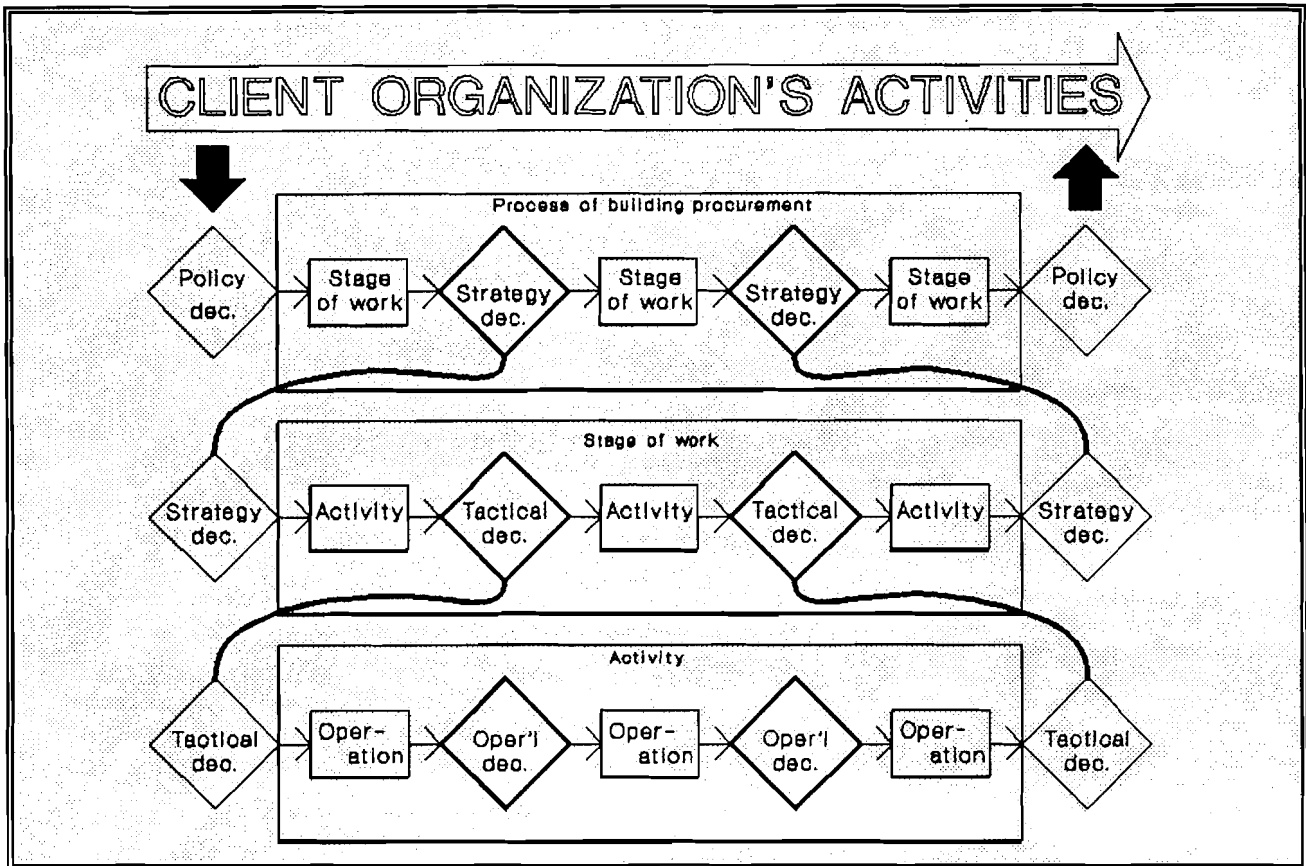


Figure 3: Decisions, stages of work, activities and operations

3.3 Strategic decisions

The identification of the stages of work is the next step in the process. There are seven distinct stages through which all building projects must pass in order to achieve completion, as in figure 1. These stages of work are punctuated by strategic decision points according to the pattern shown in figure 3. Strategic decisions are those which link the project with its immediate environment. They also offer the client an opportunity for feedback on the project, to review progress and to enable an informed decision to be taken about proceeding with the project. Some of these decisions are subject to severe constraints by circumstances beyond the project boundary, for example planning issues. The example in figure 4 shows how two strategic decisions (items 48 & 54) define the beginning and end of the Detail design stage of a project. This example is taken from an analysis of a catering extension to a hospital in England.

3.4 Tactical decisions and work packages

Although the stages of work can be described in a way that will suit all projects, the actual tasks to be undertaken within each stage of work are unique to each project. In order to be able to define the breakdown of the project into identifiable work packages, it is essential to identify the tactical decisions which will be required to progress the project through a stage from the trigger decision to the terminal decision. Thus, the next level of decision needs to be defined. Tactical decisions are concerned with the deployment of resources and the management of the project on a day-to-day basis. The requirement is for a set of decisions which will incrementally progress the project to the objective for that particular stage of

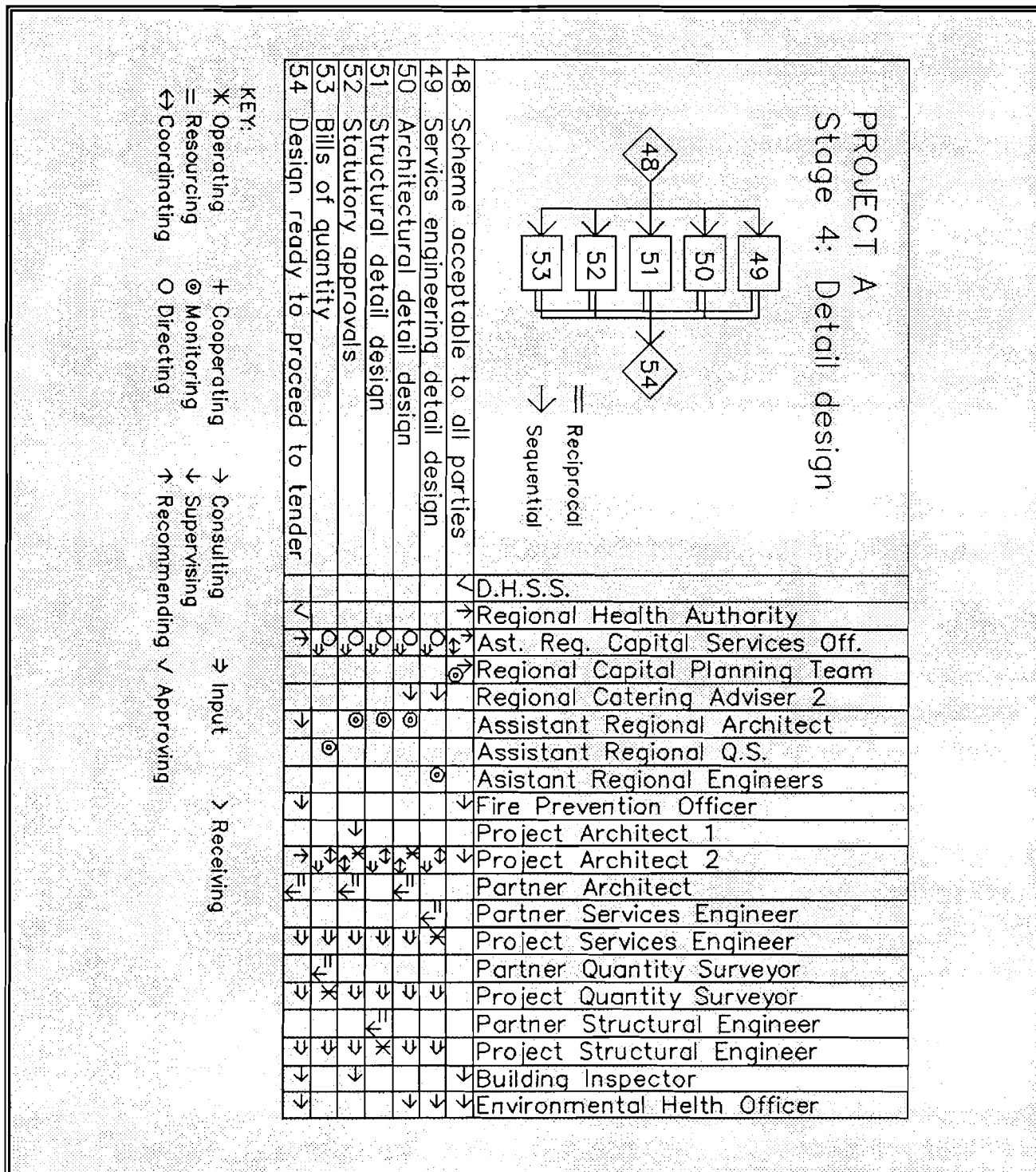


Figure 4: Example of a 3R chart

work. In figure 4, the example shows how the tactical decisions are coincident with the strategic decisions, creating a situation where the operations in this stage occur in parallel.

3.5 Responsibilities and inputs for operations

Between each of the pairs of tactical decision points, work is required to be done. The nature of this work now has to be defined. Each operation can be named, and the responsibility for its execution identified. These can be seen in figure 4 as items 49-53 inclusive. Responsibilities for undertaking the work in each operation are

denoted by an asterisk under the relevant column. In addition to deciding who is going to undertake each operation, it is also necessary to decide upon the requisite level of input from consultants, occupiers, end-users etc., depending upon what is relevant for the project. Clearly, this pattern of involvement should reflect the project objectives. Therefore, if the project is intended to be used, and liked, by the public, then they should be consulted. This would probably not be the case if a private facility was being provided. The other inputs of interest are the outputs from preceding operations. This is shown by the double arrow symbol in figure 4.

3.6 Control systems related to objectives

The Environmental Complexity Analysis will have revealed the need for control of differing kinds. This now needs to be implemented in the design of the organizational structure. Having identified the responsibilities for undertaking work on the project, it is now necessary to identify the opportunities for monitoring output from these people, and for comparing it according to certain criteria to previously set yardsticks and plans. The nature of the monitoring, and the nature of the criteria for success, are dictated by the type of control being considered, whether it is Budgetary, Contractual, Functional, Time or Quality. This must be related to the objectives for the whole project, as well as the sub-objectives for the particular stage of work. It will be useful to decide upon the nature of the interaction between the control systems, so that different priorities can be related to each other, and sub-optimization of overall objectives can be done in an informed and pre-planned manner. In figure 4 control is effected by a combination of the roles of monitoring, resourcing and supervising.

3.7 Co-ordination, integration, feedback and client involvement

The nature of the management patterns can now be added to the previous information to give a comprehensive picture of the organizational structure. By allocating management personnel with roles for co-ordination, integration, feedback and client involvement mechanisms, the full range of responsibilities can be described before the project begins. Depending on the nature of the project, and the complexity of the operations, different types of co-ordination can be allocated to one or more people. Integration can be achieved between operations by identifying senior project staff who will be responsible for ensuring that all of the different sub-systems of the building interact in an effective way. In the example in figure 4, this is achieved by the Assistant Regional Capital Services Officer, in the third column of the chart. Client staff can also be allocated to specific monitoring, consultancy or supervision roles to ensure that the client gets adequate inputs to the process, and receives adequate information from it. This leads to the final stage.

3.8 Job descriptions

The final stage in the design of an appropriate organizational structure is the its implementation. This is done by analysing all of the preceding choices about who is going to do what, and using that as a basis for defining job specifications for each of the contributors. In this way, the consultants who are invited to work on the project can be given a comprehensive description of the involvement required from them. This will help them to quote fee scales which are competitive, and it will help them to plan the work in their own office more effectively.

4 CONCLUSION

The process of analysing the environmental needs to be repeated at regular points during the procurement process to ensure that the organizational structure is adaptive to the changing environment. It is proposed that this flexible approach to the management of the procurement process at the strategic level will help to overcome many of the problems which are inherent in construction. The current trend towards pre-determined procurement paths is not always in the best interests of the client.

The 3R technique enables rapid and unambiguous communication of ideas about organizational structure. The ease with which the technique can be used means also that changes can be made whenever necessary during the project. In this way, the procurement path can be tailored to meet the needs of the particular project, in a flexible manner, rather than simply offering a choice from amongst a number of pre-determined procurement options.

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International Council for Building Research Studies and Documentation

WORKING COMMISSION W92

PROCUREMENT SYSTEMS

**SYMPOSIUM
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YUGOSLAVIA**

"CONTRACTS AND TENDERS IN CONSTRUCTION IN THE USSR (STATUS AND DEVELOPMENT PROSPECTS)"

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GRAĐEVINSKI INSTITUT

CONTRACTS AND TENDERS IN CONSTRUCTION IN THE
USSR

(Status and Development Prospects)

CONTENTS

Capital construction in the USSR is now regulated by formal legal acts issued by the centralized system of economic management.

One of the main legal documents in construction is the Regulations on Contracts for Capital Construction ratified by the USSR Council of Ministers on 26 December 1986. They contain rather detailed rules on conclusion and execution of contracts, the rights and obligations of customers and contractors, their responsibility for planned commissioning of production capacities, projects, buildings, structures, residential houses and social facilities.

Given centralized planning and the predominance of centralized state investment, the Regulations are in fact an instrument which divides responsibility between the customer and contractor for performance of functions during construction. Under the recent system of rigid centralized investment management the customer and contractor were not free agents and could not freely determine the terms and conditions of their contract. Both had to conclude contracts for projects included in the state plan, irrespective of their wishes or sometimes their capacities. Moreover, the customer in the USSR is different from investors in market economies who can invest money in a project and demand performance from contractors. Our customer is obligated to use his own resources to perform some important operations in the construction projects, e.g. to provide project documentation, supply and tune up technological equipment, etc., which required rigid regulation of the customer's and contractor's responsibility.

This is why the operative Regulations provided for responsibility of the sides, including liability, e.g. for belated conclusion of a contract, belated transfer

off technical documentation and equipment. Settlement of disputes related to the conclusion of contracts is indicative of the nature of the Regulations. Such disputes are examined and settled by superior organizations, i.e. ministries and departments. As a result, disputes about construction of a small residential house in Yakutia had to be examined by heads of ministries in Moscow who were not always fully aware of the subject and causes of disputes.

But even the tough Regulations failed to ensure timely and quality performance since in a centrally planned environment construction depends on many other normative acts and actual steps taken by the sides. E.g. centrally planned annual distribution of investments often failed to provide funding within the period stipulated in contracts, and the overloaded plan of the contractor often prevented him from performing all of his contracts. The ratification of the operative Regulations was followed by a number of legal acts which changed the procedure of payment for the work, liability for untimely commissioning. This did not help relations between the customer and the contractor. Moreover, capital construction is now governed by dozens of legal documents and instructions adopted by different ministries. They also complicate relations between participants in the investment process.

A serious block to the formation of an investment market in the USSR is the existing system of pricing. It is based on rigid, centrally ratified rates and admits of no deviations, even if the customer and contractor are in agreement. The very notion of "contractual price" appeared in legal documents only in 1986, yet the operative methodologies of determining contractual prices insist on the same old rigid rates.

The Soviet system of preparing contracts is very different from the world practice. It appears advisable

to use positive foreign experience in the following areas:

In order to create a contractual mechanism of interaction between participants in the investment process and enhance the role of the contract:

to increase 2 to 3 times the amount of fines paid for belated commissioning of production capacities;

to create a really effective system of guarantees, including the obligation of the general contractor and subcontractors to remedy all defects free of charge, within at least 1-2 years (4-5 years for some projects) of exploitation of the commissioned project;

contractual prices should pay regard to the demand, possible changes in construction costs, quick methods of costing based on similar projects stored in a data bank, methods of costing by aggregate elements and types of work, specific parameters of buildings, units of area, etc.;

In order to introduce more competition in design and construction and to change socialized forms of production organization:

to abolish the monopoly of a number of chief design organizations for technological design, to invite tenders for major investment projects using as an efficiency criterion an optimal combination of the date-cost factor; to promote competition among contractors for customers. At the initial stage the emphasis on this competition could be made in construction of privately-owned houses, social facilities, small production capacities in distributed construction, as well as apartment houses and urban infrastructure;

to create small, mobile and well-equipped construction

organizations for finishing work, installation of sanitation equipment, specialized assembly work, rehabilitation of urban centers; and small enterprises manufacturing and assembling construction materials;

to promote the establishment in each big economic district of consultative organizations to study demand for investment collect information, carry out estimates and other economic calculations for small construction organizations, to set up data banks for them and apply state-of-the-art computerized methods of calculations;

to promote the establishment of independent inter-regional data banks on all construction organizations, their specialization, production capacity, departmental subordination and other technical and economic parameters;

to carry out a program of anti-trust measures and raising the level of specialization of construction organizations.

In order to improve organization structures of management:

to assist in setting up investment design-industrial-construction associations which will carry out design work, construction, production of some types of industrial structures, assembly of technological equipment, its debugging and commissioning, regarding this type of associations as the main activity in turn-key construction of facilities and some mass construction projects;

in implementing major investment programs at the regional and sectoral levels to use methods of professional management in order to integrate the interests of different participants of the investment process, to ensure the most efficient implementation of such

programs, with due regard paid to economic, social, environmental, technical and other factors;

to promote a diversity of organizational forms of construction and management of the investment process, to improve the mechanism of contractual relations and ensure free choice of the forms and methods of organization (traditional, design - and - construction, managerial-construction), and to this end to make relevant amendments in legislation on construction.

Our country is preparing a transition to market relations. The process is characterized by extensive debates on rates and stage of this transition. Relevant legislation in the investment sphere is being prepared. But the absence of a generally recognized concept of this transition to market relations slows down the adoption of new laws on construction.

The legal situation in regard to contracts is characterized by formal application of previously adopted documents and actual abolition of some of them that governed a big portion of the investment sphere. The USSR government decided in July 1988 liability for breaches of contract, as provided for in relevant normative acts, is applied to customers and contractors only with regard to projects included in the state plan, and payment of fines for untimely commissioning applies only to projects built with centralized capital investments.

Until very recently, including this year, centralized investment and projects ordered by the state have accounted for the bulk of all investments in capital construction. Their share will sharply decline in 1991. If operative legislation is preserved the absolute majority of contracts will be concluded by mutual agreement between the customer and contractor without any state regulation. But the same rigid pricing system will continue to act.

Given the shortage of building capacities, the lack of legal regulation of conclusion of contracts and liability may result in the contractor's absolute diktat.

Necessary legal instruments are prepared in the USSR within the overall effort to formulate a concept of transition to market relations and legitimation of these relations. A number of central economic departments have prepared and submitted to the government the draft Law on Investments in the USSR.

The draft regulates relations of all sides and private individuals that participate in the investment process, establishes a legal and institutional framework of investment activity, adoption of decisions on investment programs, formation of a market of state orders for construction work and a market of decentralized investment.

The draft Law takes into account the principles of republican and local self-government and should promote decentralized investment by state-owned enterprises as well as enterprises owned by other entities and citizens of the USSR. The draft has absorbed much of the Western experience of legislating in the investment sphere.

However, intensive negotiations on a new Union Treaty which will take into account the Union republics' economic sovereignty, are under way. This will obviously require amendments in the Law on Investments.

Incidentally, the draft does not specify the legal status of foreign investors. It merely places them on an equal footing with Soviet participant of the investment process. A special Law on Foreign Investments in the Territory of the USSR will be prepared.

New General Regulations on the Conclusion of Contracts

for Capital Construction is expected to be adopted to regulate relations of all parties. Several alternative drafts drawn up by different organizations are under discussion. Their common point is the intention to bring the form and content of contracts closer to international terms and conditions.

Clearly, for the moment the country cannot adopt regulations on contracts identical to international ones. The investment process in the USSR is totally different from that in Western countries. E.g. we do not even have such a notion as an engineer-assign of the customer for performance of construction contracts.

Unlike the previous regulations, the draft General Regulations define the concepts used in contracts. They provide for tenders and their main organizational principles. At the same, given the virtual absence of competition, the draft define the procedure for concluding contracts without tenders.

In our view, the adoption of this document will bring order into relations between those who participate in construction and will promote the efficiency of investment.

A pricing reform is an essential element of transition to market relations. Its tactic will be developed in conjunction with the concept of transition to the market which is to be discussed at the next session of the USSR Supreme Soviet. Meanwhile we can only express our personal considerations and say what has been done in regard to pricing during the preparation of the first version of the transition concept presented by the government to the USSR Supreme Soviet last May.

In our view, this transition to free contractual prices will lead to unchecked inflation in the total absence of competition. By driving their prices up construction

companies will generate huge profits even if they drastically cut the volume of construction. So the state's first task is to create conditions which will promote competition on the investment market. To this end, it is necessary to speed up destatization (privatization) of state-owned enterprises by leasing or selling them to worker collectives, transforming them into joint-stock companies, etc. At the same time, incentives should be provided to encourage the establishment of new joint-stock construction companies, cooperative and small enterprises set up by organizations and individuals. This should be paralleled by the development and adoption of anti-trust legislation. We think that it will take from several months to 1.5 year to create conditions for competition. Meanwhile the state will regulate prices in construction.

The government's first transition concept envisaged that as of 1 January 1991 new wholesale prices of production-and-technical products will be set which will take account of production costs and be more realistic, in light of world market prices.

This will change production costs in construction. It follows that prices of construction will have to be changed. CRICEM has developed price indices for construction products in different sectors. If the government's concept of transition is adopted in regard to pricing, as of the beginning of 1991 estimated construction costs and contractual prices of construction and assembly work will be recalculated in accordance with these indices. But contractual prices will have to pay due regard to inflation, the contractor's risks related to unstable supplies, and some other factors.

Later on, with the coming of competition and free contractual prices, the approved price rates and indices can be used as recommendations for preliminary estimation by the customer of construction costs before tenders.

In the light of the above, it is expected that with the transition to the regulated market economy and introduction of laws and regulations on state regulation of the capital construction market, the following two basic models of the contractual price will operate simultaneously:

the regulated contractual price;

the free contractual price.

Regulated contractual prices will be set in the absence of competition among contractors, in a highly monopolized environment. They will be based on estimates using basic industrial prices to be introduced in 1991 and price indices. Central regulation will also apply to general norms of pricing (overheads, other limiting costs, profit), price increments for inflation, and price increments for the customer's special requirements in regard to dates and quality of the work.

Free contractual prices can be used in an environment of real competition among contractors, with strict observance of all procedures related to tenders. Free contractual prices will be based on the customer's estimated construction costs compared to estimates submitted by the contractor in his tender.

In the light of experience in different countries, we think that it would be appropriate the following estimates when setting free contractual prices: the investor's estimates, the contractor's offer, additional estimates, the performance estimates. Taken together they will form a coherent system which will pay regard to each element of the price, given contractors' competition.

It is expedient to break down Soviet stereotypes of

contractual prices in construction and estimated prices of technological equipment. To radically cut unused inventories and shorten the investment cycle in industrial construction, it is appropriate to introduce the notion of "contractual price of the technological part of capital investments" which is to be determined by the customer together with the main machine-building enterprise or the enterprise which supplies components. The latter will be general contractors for the technological part of capital investment and will be responsible for the manufacture, supply, installation and debugging of equipment. This will require replacement of the single form of coordination (when the construction company is the general contractor) with a multiplicity of coordination and cooperation links in the investment process that characterize the world practice.

Tenders are one of the main instruments of market relations in construction and development of enterprise in the investment sphere. The world has accumulated a vast body of experience in tenders and competition which is absent in our country.

The high degree of monopolization in design and construction, the years-old traditions of relations between customers and contractors, and other factors complicate the introduction of tenders in capital construction. This is why it appears advisable to introduce in the end of 1990 experimental provisional regulations on tenders in areas where conditions for competition among construction companies are present or are created. A new expanded version of such Regulations on Tenders could be worked out on the basis of the experiment's results and international terms and conditions of contracts.

The program of transition to tenders in capital construction, which is being developed, should:

reflect questions of legislation on tenders in the drafts of some laws and new rules on contracts;

contain anti-trust measures in capital construction; provide for the establishment of a State Committee on Tender to monitor tenders for construction of state-ordered projects;

provide state assistance in the establishment of cost-accounting engineering firms to study the construction market, organize tenders;

arrange monitoring of prices, publication and distribution of relevant bulletins;

provide for the development of predictable prices indices;

provide for the establishment of a Center for training of specialists on construction costing in a market environment.

CONCLUSION

The USSR is now radically revising the procedure for conclusion of construction contracts. Tenders for contracts are regarded as a main instrument of creating market relations and developing enterprise in the investment sphere. It is advisable to use relevant world experience in adopting new methods of legal regulation of contracts and optimizing prices. This will boost integrative processes in European economies.

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**WORKING COMMISSION W92
PROCUREMENT
SYSTEMS**

**"MANAGEMENT CONTRACTING -
REVIEW AND ANALYSIS"**

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YUGOSLAVIA**

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GRAĐEVINSKI INSTITUT

MANAGEMENT CONTRACTING - REVIEW AND ANALYSIS

INTRODUCTION

For the last decade or so the client of the building industry has become accustomed to using familiar procurement methods with different organization patterns. From his experience the client learned that when using Management Contracting (MC), Design and Build (DB) and Project Management (PM) is not practising the traditional method of contracting whose name appeared in the industry for many years. Similarly the client has discovered that the field of procurement methods is quite different in their concepts. MC is defined as one whom the contractor join the design team to ensure buildability and all construction works are executed by traditional sub-contractors. DB is one where the contractor is responsible for design and construction process of the building. We are all familiar with the traditionally organized method where the design is separated from construction and the architect is fully responsible for the design. Moreover, the client who has experienced even one non traditional approach also know that there is a difference in the system function which influence the performance of the project.

A central interest of various procurement methods is the variable 'performance. Performance measures can be divided into two sets of variables: objective measures of project success; and subjective measures of client satisfaction. When the client express a high level of satisfaction to time, cost and quality, we may refer that the project is successful. But the client may not be experienced enough to judge performance or he might be concerned with certain criteria and ignoring others. Therefore objective measures ought to be taken to evaluate cost and time.

The author has developed a theoretical model for comparing performance, in a sample of 39 management contracting projects and 30 traditional contracts (1). Several variables have been identified which could influence project performance. The interconnection between these variables were then postulated in the model shown in fig. 1. The model stimulate the hypothesis that:

'MANAGEMENT CONTRACTING CAN SATISFY CLIENTS WHO NEED THEIR PROJECTS QUICKLY AND FOR PROJECTS THAT ARE LARGE AND/OR HIGHLY COMPLEX'

Statistical package was used to formalize and standardize procedures for drawing conclusions. The statistics selected were chi-square test, correlation and Spearman's RHO coefficient. Structured questionnaire was developed to determine which of the two systems (management or traditional contracting) performed better on time, cost and quality. The information gathered from the questionnaire separated speed from time overrun; and cost/sqm from cost overrun.

This paper is composed of two sections. The first section reviews the system of MC and the second examines project performance v procurement method of the research model

SECTION 1 - REVIEW INTO MANAGEMENT CONTRACTING

Management contracting was first formally used in the UK around early 1970 and there is now much competition among large construction firms to enter and be prominent in the MC market. The author's study was initiated by interviewing eighteen principle management contractors and ten clients who provided a picture of the development of MC as well as their perception towards MC. The results emanated from the interviews were published in the CIB-W65 in 1984 (2) and in ASCE in 1987 (3). In particular it identified the following points:

A. PILOT STUDY WITH MANAGEMENT CONTRACTORS

1. In the private sector, the building team used the management contractor's own form of contract on 80% of the projects. The public sector eg. PSA, BAA and recently some large private owners have developed their own form of MC with modification to suit the particular objectives for a particular project. A fundamental element of the contract is the fee structure and two types may be identified:

A. Cost reimbursement for preliminaries and sub-contract work + management fee.

B. Lump sum for preliminaries + reimbursement for sub-contract work + management fee.

The management fee represents the overheads and profit. The management contractor is paid a fixed fee for the services provided at the design stage.

2. The percentage of traditional contracting is still greater than other forms of contracts, on average 50% of

the management contractor's construction output, with 25% for MC and 25% other types of procurement methods eg. PM and DB.

3. Analysis of MC projects indicated 63% of the projects were new buildings, 27% refurbishment work and 10% a mix of both.

4. Results of the market distribution showed that 68% of the projects have been commissioned by private sector clients and 27% for those in the public sector and 5% by a public enterprise in conjunction with a private organization.

5. When the projects were divided by value, the results show that 32 of the projects surveyed were offices, 28% commercial complexes, 27% industrial work and 13% accounted for residential and public premises.

6. The number of clients using MC was estimated to be over 200 organizations. 50% were clients seeking bespoke building, 18% property developers, 9% investment companies and 33% for other forms of public and private clients.

PILOT STUDY WITH MC CLIENTS

1. the results of the client's studied showed that management contracting work accounted between 3%-8% of the firm's total expenditure on construction work. The prominent criteria of the 10 participating organizations for choosing the MC method were minimizing the overall time of the building process; obtaining reliable time estimates for the project; and suiting large and complex projects.

2. There were conflicts of opinion concerning the risk to be absorbed by clients when dealing with a MC. Three clients saw the principal risk arising from the absence of a tendered lump sum price from the main contractor prior to construction. Another client claimed that clients are subject to a greater risk in respect of costs because of the staggering and phasing of orders for specific work over a long period. While in the traditional method it was the main contractor who was taking that risk by putting a lump sum bid out at the outset.

3. All clients studied agreed that MC is flexible in that it enables variations on the original design and specifications throughout the course of construction: they added that cost can be controlled by changes in the design but without affecting project performance.

4. Frequently the time factor was seen as one of the major advantages of MC: none of the clients commented unfavourably about the MC's time performance. All clients agreed that a MC reduces the precontract period.

5. Conflicting attitudes about the cost factor were observed. When interviewing a large public client, a mismatch between the expectations of a public body and the procedures of MC with uncertain final costs, could be observed. It was reported that, because of the way the public sector is organized, it is naturally biased towards caution in committing themselves to spending taxpayers' money. However, a second public organization did not feel constrained in using MC due to public accountability because they had to change their building procedures.

A private banker stated that there is a tendency for greater involvement of the professional consultants: 'The architect and QS get involved more than they should in some work which is the MC's job.' This overlapping responsibility was reflected in higher fees being paid.

6. None of the clients interviewed felt that MC produced a better building design than the traditional method, but most clients stated that they did not choose a MC for that reason in the first place.

SECTION TWO - PROJECT PERFORMANCE (SEE MODEL C15-C25)

Almost certainly neither of the system optimizes the performance of all cost, time and quality at any one project. But we can say that one system tend to overrun on cost or time more frequently. Whether we can make such judgement depend on other variables before we can have confidence that one system really differ in performance. A common problem with such research is to determine, in terms of similarity of projects, whether observed characteristics of the project are the same between the two samples. In practise, no two projects are identical. Whatever cautious is taken we are likely to find that the characteristics of client, the designer, the project and so the contractor's efficiency differ. In case of bad performance, we can not be certain who is responsible. Therefore, in order to minimize the scale of variables, the procedure adopted in this research was to choose case studies as follow:

A. Clients that are experienced with the building process but not necessarily with MC.

B. Designers who experienced MC in two or more projects.

C. The projects selected were industrial and commercial buildings only.

D. Majority of projects were newly built by the 18 principle management contractors

KEY RESULTS

1. The mean pre-construction time for both systems showed that MC had less periods than traditional ones by overlapping the design and construction process ($P < 0.02$). The nature of the project had a substantial bearing on the systems used for each client. In the traditional contracts, it is more likely for the design characteristics to be more important than for MC projects. On the other hand, a MC projects had greater complexity in the construction process and the contractor's contribution to the design is greater to obtain flexibility and early start on site than obtaining a sophisticated design.

2. The results showed that construction time for some MC were shorter than traditional ones but the association was found significant at a conventional level only ($P < 0.05$).

3. The results for the mean overall project time ie. (pre-construction time + construction) showed that traditional contracts took longer total time than MC ones, and on a highly significant level ($P < 0.025$).

4. The results into construction time, of point 2 above, take into account only the size of the project in terms of cost only and did not consider the the gross floor area in square metres ie. speed of construction. Therefore a matrix of speed / unit cost was constructed and the results showed that higher proportion of MC were constructed faster or with medium speed during construction compared with those of traditional contracts. But the results were significant at a conventional level only ($P < 0.05$).

Faster construction was achieved when the client made a substantial investment appointing a project manager / controller acting on his behalf on site. Moreover it was found that fast construction techniques developed from MC's input were valuable in saving time.

5. The spread of cost performance across the cases was relatively wide. Although the mean unit cost of traditional contracts were lower than MC ($P < 0.05$), a large proportion of the variance had been explained by major

differences in the nature of the buildings and the level of quality standard that would be specified by the client at the outset of the project.

6. The results indicated that more likelihood for traditional contracts to overrun on time than MC. Project procured on traditional contract registered an average time overrun of a mere 8% compared to an average of 5% using MC. However, the association for time overrun was tested and it was found that the difference was significant at a conventional level ($P < 0.05$).

7. Similarly, MC outperformed the traditional method in respect of cost overrun and the difference was highly significant ($P < 0.001$). The former averaged a cost overrun of only 3% compared to 7% recorded by traditional method. It was concluded that MC are more reliable on time and cost than traditional contracts.

The better performance of MC over the traditional method was attributed to the fact that MC provided more integration of the various disciplines in the construction industry. However, it was also stated that since MC has a high market orientation it could be argued whether the estimated time and cost were the right ones at the outset of the project.

Moreover, under a MC there is one professional body that is responsible for managing the building process and he is fully and solely work for the client's interest.

8. The results revealed that MC gave higher level of client satisfaction to the overall time factor ($P < 0.025$).

9. There was no difference in the level of satisfaction with regard to cost between management and traditional clients. Given the fact that the probability for a MC to exceed the budget is less than the traditional method but can cost the client more, this can emphasis the suggestion on the importance of cost reliability rather than cheapest cost to project success.

10. There was no clear evidence to indicate that the level of client satisfaction on quality is associated with the procurement method studied. Nevertheless, under a MC the client criticized the system for not producing a higher standard of quality in the building for reasons attributed to the conflict between the management contractor and the architect, and to the problem of who has to decide on quality standard.

CONCLUSION

From the evidence available in the author's study we must conclude that, unsurprisingly, neither of the systems is the solution to all of the problems facing the construction industry. To achieve project success the parties need to match the various organizational forms to the type of client, his criteria and priorities in respect to time, cost and quality. It was also apparent that even though client's attitudes are influenced by the experiences of individual clients it seems that there is a room for improvements in the MC system itself. One such shift would be for management contractors to adopt a professional as opposed to commercial role. Yet this change may be shaped to fashion events by matching their own management procedures to the requirements of the procurement method they have chosen. Project success is often elusive but the appropriate mix of client and procurement method can make it less so.

Another major conclusion of the research, though the variables are not covered in this paper but can be a matter of discussion in a further occasion, was that procurement method can be an important variable in affecting project performance but not by itself is the only determinate. The independent variables of client requirements, the designer's characteristics, the nature of the project as well as the contract procedure employed (ie. by competition or direct negotiation), all had their relative effect on certain performance measures as defined by time, cost and quality.

OUTLINE IMPLICATIONS FOR CLIENTS

A scoring matrix for project performance was constructed in an attempt to give the client some indication of how both systems scored for various types of clients and projects. The following are the main implications:

MANAGEMENT CONTRACTING

1. Best performance can be achieved under a MC for a bespoke clients building on industrial projects with a cost greater than £5M (in 1984 prices) and an area more than 7000SQM.

2. High performance can also be achieved for speculative developer building commercial projects which are complex and costing more than £5M. A MC showed similar performance for normal size projects (ie. < £5M and < 7000SQM) with normal complexity.

3. Poorer performance was noted by speculative developers on building projects of less than £5M.

TRADITIONAL CONTRACTING

1. The traditional approach can provide best performance for speculative developers on building projects of normal size with a low level of complexity.

2. Clients who are building industrial or commercial projects costing less than £5M of normal complexity also showed good performance within the traditional contracting sample.

3. Poor performance under traditional contracting was evident for bespoke clients who were building large projects with a high level of complexity.

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**PROCUREMENT
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**"A COMPARATIVE STUDY OF THE
PROCUREMENT METHODS
FOR DESIGN WORK, WITH
PARTICULAR REFERENCE TO THE
"DESIGN & BUILD" CONTRACTS"**

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GRAĐEVINSKI INSTITUT

A COMPARATIVE STUDY OF THE PROCUREMENT METHODS FOR DESIGN WORK, WITH PARTICULAR REFERENCE TO THE "DESIGN & BUILD" CONTRACTS

INTRODUCTION

From a recent on-line search of reference material for this Paper, it appears that almost no previous research work exists in this important area. Furthermore, the available material relating to design management research does not figure in the databases except within the areas of marketing and sales. It is therefore vital that architectural management is exploited wherever and whenever possible, so that future researchers have a much broader base from which to start.

The UK building industry has hardly developed, in managerial terms, for over one hundred and fifty years. Each discipline was separated from the others by its training, its professional institution and its method of operating. Architects were (and to a large extent still are), advocating and enjoying one 'standard' form of contract and one recommended scale of charges for their services.

Successive governments have commented on the fact that 'in no other great industry is the responsibility for design so far removed from production.'⁽¹⁾ Architects had distanced themselves from builders. The RIBA imposed constraints on its members which restricted their activities to mainstream design of buildings. It forbade the commercial practices of marketing their services overtly, or the bonding with other disciplines or industries by any form of commercial union.

It was the Monopolies Commission, which started to look at other British professions, that caused the RIBA (and its members) to hastily reconsider their position in the early 1980s. All of the major restrictive practices were lifted; commercial opportunities became available and the architects found themselves almost thrust into the market place with little protection from the old fee scales nor the old protective practices.

The RIBA Architect's Appointment

What does the architect expect to do for his commission? According to the standard form of architect's appointment⁽²⁾ the architect "assists clients at all stages of a building project and co-ordinates all the elements of design and construction process." It further states that "the architect's primary professional responsibility is to act as the client's adviser and additionally administer the building contract fairly between client and contractor. Therefore, he (or she) is firstly a co-ordinator of the design and construction processes.

(1) Ministry of Public Building and Works. Committee on the Placing and Management of Contracts for Building and Civil Engineering Work. 'The Placing and management of contracts for building and civil engineering work.' Report of the Committee. Ministry of Public Building and Works. Chairman: Sir Harold Banwell. London. HMSO, 1964.

Great Britain, Ministry of Works. Survey of problems before the construction industries: report prepared for the Minister of Works, by Sir Harold Emmerson. London, HMSO, 1962.

(2) Architect's Appointment, RIBA, London, February 1990,

One might have expected conditions to state that the architect actually designs the building and this is certainly the expectation of clients. It may come as a surprise to many non-architect designers to find that their common law liability for design is more onerous than that imposed by the RIBA conditions which warrant only that the designer is a reasonably competent person and that he will exercise the skill of a reasonably competent designer.(3) Secondly, the architect is to act as adviser to the client; in this he clearly has a professional responsibility. His knowledge of the design and construction process must be adequate and sufficiently specialized in order that he is in a position to offer advice to the client. Thirdly, the architect has to be the administrator of the contract between the two parties to the building contract - the client and the contractor. In this role he acts as a quasi arbitrator who is frequently put into the invidious position of making an adjudication against the very person who is employing him.

It is within this confused and perhaps obscure basis of engagement that many architects have recently explored other routes of procurement; other forms of contract; other constructional techniques; and other non-standard methods of providing their services. The 'traditional' route has now been eroded by forward-thinking architects, clients and contractors who have experimented with many systems, and some of these will be explored in this Paper.

A variety of procurement routes

The procurement of design services is inextricably entwined with the organizational management of the construction process and the division of roles and responsibilities. At the most basic level the architect may offer his services to produce a design for a building and have no further interest nor involvement in the building. This service may be offered to a private client or a builder client, either of whom will take over the responsibility for the production of the building, using the architect's design.

In 1983 the British Property Federation (BPF) produced their solution(4) to the 'traditional' methods of procurement and management. Being representative of the largest property owners and developers in the UK, the BPF were able to influence matters in a more demonstrative way than any previous body, including the government. The BPF system introduced for the first time the notion of a technical client's representative (who may or may not be an architect), a design leader (to co-ordinate the design processes) and a separate supervisor (who again, may or need not be an architect) to maintain standards of the contractor. All design activities were not confused by other responsibilities and the co-ordination role was to be undertaken by a separate design leader. All parties were appointed by the Client's Representative with separate contracts between themselves and the Client. Note that this stripped the architect of his advisory, co-ordination, supervisory and arbitration roles which are the buttresses of the standard conditions of engagement.

(3) M Toole. Design work by sub-contractors. Construction Law. Vol.1, No.1, April 1990.

(4) Manual of the BPF System - The British Property Federation System for building design and construction. 1983.

Project management and construction management techniques(5) are still undergoing development as are the earlier management fee systems. Each of these methods virtually excludes the architect from his duties beyond the design of the building. The contractor (or manager) has a direct contractual relationship with the client, he is treated as an equal professional with architects and others. The responsibility for design and production distance themselves yet again from one another. Management contracts have recently suffered from considerable criticism from clients who expressed dismay over the lack of control over the final costs. Some clients forecast a growth in construction management, probably in the hands of a limited number of large contractors.

Design and Build

A study of the design and build market(6) showed in 1987 that architects, clients and contractors all expected the size of the market to increase substantially in the following five years. A study was conducted by the Centre for Construction Market Information (CCMI) and was sponsored by the RIBA through the Client's Advisory Service and several leading contractors. On the basis of the answers received from architects, clients and contractors involved in design and build and an examination of the recent contracts, CCMI estimated that the total value of the non-housing design and build market was in the region of £1500million during 1986. This was over 20% of the total non-housing new build market. They also expected a growth rate of 18% for 1987.

Of the respondent architectural practices with experience of design and build 80% had 11 or more architectural staff. During 1986, 73% of the practices which had used the design and build approach stated that it accounted for less than 25% of their total workload by value. The vast majority of practices (88%) expected the contractor's market for design and build to increase in the next three years. In the period after that, 59% of practices expected the market to expand. 77% of practices thought that the amount of design and build work for the whole architectural profession would increase during 1987.

The report's analysis of design and build projects provided an insight into the structure of the market with important implications for the architectural profession, in particular the increasing role of the contractor rather than the architect in the initiation of projects. During 1986 of the overall value of non-housing design and build work about 10% involved refurbishment and 27% was carried out for the public sector. Sixty percent of the projects analysed went to a one stage bid, with 26% being negotiated and 14% proceeding to two stage bids. Furthermore, 77% of projects involved lump sum prices.

Most of the projects (63%) analysed were initiated by the client's internal department. Contractors and surveyors were each responsible for initiating 18% of the projects. Architects only initiated the use of a design and build solution in 4% of cases. There is a clear message for the architectural

(5) Building Procurement Systems - a Guide to Building Project Management. James Franks. Ascot. CIOB. 1984.

(6) Design and Build. CCMI. July, 1987. London.

profession here. Either it views design and build as a serious option for certain building projects or it risks losing out to other suppliers of services in the industry in what is a growing sector of the market.

The selection of the architect at the concept stage was evenly divided between the contractor's choice (47%), contractor's in-house architects (30%) and the client (22%). However, at the detailed drawing stage 70% of the architects were the contractor's in-house employees, with 16% being the contractor's external choice of consultant and 11% the client's external selection. However, these projects were selected by the contractors themselves and may have been distorted by their choice of example.

The average value of the design and build projects examined was £2.75million with 37% of the projects being worth between £1million and £5million. This compares with the average contract value for all building work of approximately £220,000. Although there may have been an element of bias in the respondents' selection of contracts it is clear that the average design and build contract is worth considerably more than the average building contract.

Perhaps the most interesting finding of the report was the fact that at the outline design stage 41% of architects said that they worked on a 'no job, no fee basis.' At the detailed design stage the proportion was lower at 16%. CCMI concluded that, 'it is apparent that the architect is subject to a fairly high risk element.' They based this conclusion on the fact that in one in five cases the practice risked receiving no fee even though a considerable amount of work may have been carried out. The figures provided by the clients were even more emphatic. At the outline stage 82% of projects were conducted on a 'no job, no fee basis.' At the detailed design stage 68% of tenders were on a no job, no fee basis. CCMI state that 'even at the full design stage a staggering 81% of tenders were submitted on a no job, no fee basis illustrating the enormous risk to the architect if the proposal should fail.' Obviously, the degree of risk associated with tendering for a design and build project is great and not all practices will be able to tolerate such a high probability of failure.

Practices tendering for design and build contracts will need to ensure that they are geared up for and have a 'balanced portfolio of risk' across the whole range of their work to ensure that the tenders that are more likely to fail are counterbalanced by bids that have a higher chance of success. Architectural practices were also asked their views on the advantages and disadvantages of the design and build approach to the client. There was more of a consensus concerning the advantages; 46% of practices felt that design and build improved the speed of the project and led to completion on time. Forty-nine percent of respondents also felt that design and build benefited the client because it established a single point of contact. There was less unanimity of view concerning the disadvantages to clients. Twenty-nine percent of architects thought that design and build led to poor design and building standards. Twenty percent also felt that such an approach means that the client lacks independent advice. The architects' views concerning the advantages of design and build to the client were very similar to those expressed by both contractors and clients. On the other hand, architects perceived considerably more disadvantages to the client from using a design and build approach than did the contractors or the clients themselves.

There was a considerable variation between the forms of engagement practices normally had with design and build contractors. The two most frequently cited were 'letters of appointment' (34%) and 'amended standard forms of agreement

(29%). The number of other forms of engagements listed by practices provided the distinct impression that practices were approaching this issue in an ad-hoc manner. This view was reinforced by practices' answers to questions concerning their relationships with contractors and what defined responsibility practices normally had for work on site. CCMI summarised their findings in this section by saying that 'some of the answers were related to answers on forms of engagement, but in general answers on both engagement and responsibility were very vague - to an extent that might be considered surprising if not disquieting.' Fully 44% of practices carrying out design and build said that their responsibility to the contractor was normally only 'vague or not defined' - only 20% said that they normally had some form of contract arrangement.

Design and Build has been a clear winner of the late 1980s construction boom according to what is probably the most comprehensive investigation of UK construction procurement. The Centre for Construction Market Information (CCMI) survey(7) revealed parallel growth in design and build and management contracting. But while most clients, architects and contractors were confident about the continued rise of design and build, they are less optimistic about the future for management contracting.

Analysis of nearly 9000 projects on a contract databank, validity checks, interviews and a telephone survey of 150 specific projects were among approaches adopted by CCMI to arrive at market estimates. All building and civil engineering sectors covered. In 1989, 15.5% (£5,568million) of all new construction orders were specified design and build. Non-housing orders accounted for 4,455million of that, compared with 1,322million three years earlier. In 1989, after civil engineering is stripped out, design and build took a 17% share of commercial projects and 22% of the industrial sector.

Managed contracts - including construction management - have witnessed the same sort of growth. They took a 14.8% share by value (£5,316million) of all orders in 1989, with management contracting believed to have captured at least 90% of that share. The average value of a 1989 management contract was 12million. Four years ago the CCMI found that design and build and management contracting had a 10% to 12% share of the non-housing market. But there was a stark contrast in the number of contractors offering the two services. There are now 495 firms practising design and build; in 1986 there were just 150. The number selling management contracting has levelled off; in 1986 there were 46, whereas now there are 57.

One of the most revealing statistics concerned the shape of the construction market in two years' time. Asked if they thought design and build would increase its share, 48% more clients, contractors and architects answered "Yes" than said "No." A majority of 12% thought management contracting would continue to win new business, and, among contractors, it gained an even more marginal majority - 2%.

Design and build projects are praised for keeping to budget and, to a lesser extent, for their speed. Repeat business is growing since design and build's success, says the report. 'It is based on trust and experience.' However,

(7) Design and Build. CCMI. July 1990. London.

only the contractors believe that the form produces better designed buildings. Architects and clients disagree. Part of the problem, says the CCMI, is the lack of guidance available to clients on how to commission design and build projects and provide a clear brief. The Centre identified the same problem four years ago and urged the RIBA to draft a guide. But the report says, 'nothing has been done and the complaint is still widespread.'

Design led and Build

Possibly realizing that work, responsibilities and fees are being eroded from the architect in his traditional role, some architects are acting as lead consultants and contractors. They take the initiative and gain the commissions directly from the client, and in addition to providing a full design service they 'employ' the contractor. The benefits of design and build as one package have always appealed to the clients who wanted one point of contact with the building team. The process therefore can work equally well whether the architect or the builder is in the lead. The possible weakness of this system is that if the architect 'employs' the builder, he is taking on an excessive level of risk should his contractor fail to perform.

Domus Design Build(8) founder and managing director, Mike Duckering, is one architect who joined the fray and is now co-ordinating the aims of design, surveying, engineering and construction staff. "There has to be a balance of power between design and construction departments in a design and build firm. As soon as one becomes dominant, it can have a devastating effect," he says. "It's like a game of snakes and ladders, but at least this way you can eliminate half the things that water down your design. Over the past 20 years, design and build has come along as a solution to the traditional roles," he says. "The industry has heaved over towards it, but it has brought with it the barnacles of traditional contracting. The larger firms brought claims, disputes and so on."

DDB's first contract was signed on 4 July 1986 with a client who has subsequently put a great deal of work the company's way. Knightsbridge Investment Trust, a local developer, wanted to put up new offices alongside a grade II listed church in the Clifton area of Bristol. The resulting structure did not try to compete with the Gothic style of the church but reflected it, with steeply pitched slated roofs and rendered facade. DDB also converted the church itself into retirement flats for the Guardian Housing Association. Other projects followed - for Knightsbridge and the joint venture company it formed with ARC Properties, Kitarc. The majority have been in Bristol's conservation zone and DDB has had to nurture the city council's strict planning department to gain approvals.

Duckering is too fond of building to endure life in the design office of an architects' practice. "More power to the elbow," is his message. "When you're working for a practice, maybe only one in ten of your designs will end up on site. In design and build, if you're making money, nearly all of what you design gets built." Duckering says that all except one of DDB's contracts have

originated with a client just commissioning design work at first, and then negotiating a price for the construction work from the firm. "This way," he continues, "you can see what really works when it is built and that helps improve the way you design in the future. Since we've started, I've found it much easier to design. Design and build is the sharp end of building; it exposes the humbug, fraud and inability of much of the architectural profession."

Fees and Finances

Even a brief investigation will prove that the traditional working method of the architect and the standard Architects' Appointment offers clearly defined rules for fees. The percentage fees are based on construction costs. The fee varies with the extent of services, the complexity of work type and the value of the finished product. Partial fees are charged for partial services. The percentage fees which are being charged in 1990 are, in 99% of cases in a recent survey,(9) all less than those recommended by the RIBA. They ranged from 9.80% (the highest) to 5.75% for a 800,000 industrial building. Other methods are lump sums for prescribed areas of work, and daywork at agreed rates of pay, by the hour, day or week.

As part of the liberalization of the architectural profession, architects may now tender for their work.(10) This again is based on the Architects' Appointment and usually expressed as a percentage of the anticipated construction costs. This illustrates, perhaps above all else, the freedom which now exists for architects to play a central role in the construction process. They are faced with commercial decisions, keen competition, and a new position in the market place.

(9) Z. Naamani. "The Management of the Design Processes in Construction." Unpublished PhD Thesis. 1990.

(10) Tendering for Architects' Services. RIBA. 1986.

Tendering for architects' services

This guidance note has been prepared by the RIBA for architects when responding to invitations to tender for work. It complements the Code of Professional Conduct and the Clients Advisory Service's Guide to the selection and appointment of an Architect.

At all times the 'Architect's Appointment' as published by the RIBA is recommended as the working document for fee tendering purposes.

Clients should be advised that in order to prepare a tender, an architect may need to engage specialist advice and that the tender process involves time, expertise and risk for the architect, which increases with the complexity of the project. Information supplied by the Client must therefore be adequate.

A Client Searches

During the initial enquiry stage a Client will probably want to meet a number of architects and visit their practices in order to draw up a short list of those who appear to be suitable for the commission. Examples of work may be requested and references to past Clients may be taken up. It may be desirable that the opportunity is given to the Client to interview staff who are likely to be involved.

B Pre-Tender

The following information should be provided by the Client or requested by the architects:

- 1 the number of architects being invited to tender (not normally be more than three)
- 2 the nature of the project, its location and visiting arrangements
- 3 the budget and funding details
- 4 the basis upon which the commission is to be awarded, i.e. if the lowest fee tenderer will automatically be appointed or whether the level of fee will merely be part of a broader based judgement
- 5 the scope of the architect's services required and the conditions which are to apply, including arrangements for payment
- 6 whether the fee tender is to be submitted on the basis of a lump sum or a percentage of the final construction cost
- 7 the basis of charging for any additional services, e.g. time charges

- 8 whether expenses are to be inclusive or additional
- 9 details of any other consultants who have been or are to be appointed and on what basis
- 10 any known constraints which could affect the design
- 11 the anticipated timescale for the project
- 12 whether the client is to instruct on the method of building procurement and type of building contract to be used or the architect to advise
- 13 details of the Client's authorisation procedures, including the name and terms of reference of the Client's representatives
- 14 the closing time, date and address for receipt of tender
- 15 the period for which the tender is to remain open for acceptance.

C The Tender

The Client should supply each tenderer with identical information at the same time.

Each tenderer should have the same timescale in which to submit proposals.

The timescale should be of sufficient duration to enable the site to be visited and questions raised and answered.

Tenderers should be advised by the Client if, as a result of queries from tenderers, issues are identified which could materially affect the range of services required, or the cost or timescale of the project. In

these circumstances it may be necessary for the Client to extend the period for tender.

Each tender when opened should be date-stamped.

All tenders should be opened at the same time.

D Post-Tender

As soon as an architect has been appointed the Client should advise all tenderers

- of the successful architect
- whether or not the tender accepted was the lowest
- of all tender figures received

In the event of deferment or a substantial change to the initial requirements provision should be made for a renegotiation of fees.

n.b. Guide to the Selection and Appointment of an Architect (Clients' Advisory Service) can be seen in *PRACTICE*, December 1985, pages 3-6.



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**"TOWARDS A MULTI-PURPOSE
MODULAR FORM
OF CONSTRUCTION CONTRACT"**

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TOWARDS A MULTI-PURPOSE MODULAR FORM OF CONSTRUCTION CONTRACT

STANDARD FORM CONSTRUCTION CONTRACTS

The Background

Standard Form contracts are generally written or commissioned by government agencies for use on the contracts that they sponsor, or by professional institutions which take it upon themselves to represent their private sector clientele by producing one for adoption by their member practitioners. The private sector is commonly represented by the architects and civil engineers (according to the nature of the project) whose role as project designers has (at least until the recent upsurge of professional project management) won for them acceptance as de-facto project leaders. In some countries where the supply side of the construction industry has acquired bargaining power, the responsibility for the production and updating of contract forms has been taken over by independent bodies on which the various interested parties are represented to greater or lesser degrees. Examples of such bodies are the UK's Joint Contracts Tribunal and the Standards Australia.

A glance through any of the 'standard forms' quickly indicates the potential complexity of the business relationships in the construction field. Comprehensive forms of agreement are inevitably substantial documents covering many different issues, necessarily involving complex interdependencies between protective and procedural terms. Well-meant attempts to simplify and shorten standard forms merely leave grey areas in which the relationships are undefined and which, in the event of dispute, can only be clarified by reference to legal process.

'Standard forms' may represent the evolved response of industry to its recognized problems. The principle 'families' of forms are the outcome of an evolutionary process and have the following obvious advantages:

- * they were originally drafted by experts
- * they have probably enjoyed a long life during which they have been revised periodically to close the loopholes inevitably exposed in litigated disputes, and thus they have become increasingly reliable.
- * similarly, over their life-span, they accumulate a body of case law which provides authoritative interpretation of their detailed provisions.
- * they become familiar to practitioners, so that they may be used to advantage and known pitfalls avoided: their terminology gradually becomes part of the every-day language of the industry and tends to shape attitudes and relationships towards a readily recognizable pattern.
- * they provide a basis for academic study and analysis leading to better understanding and to the dissemination of knowledge by way of a body of textbooks and discussion articles in professional journals.

The English RIBA/JCT forms illustrate these points. In spite of severe judicial criticism on occasion, they have survived since the early years of this century with the general approach and much of the original wording still intact. They have been used on many thousands of projects successfully and amicably completed and have, in large measure, shaped the industry they have served. A case may be made out for radical change but that does not detract from their importance: their success has been founded on their continuity and attempts at radical re-thinking have invariably been met with strong resistance from one side of the industry or the other. Their continuity has been made possible because they have come to represent what is perceived to be a fair compromise between the interests of the two sides and they therefore receive the blessing of the representative and authoritative sponsoring bodies.

But in the word 'compromise' lies their disadvantage in the view of many prospective building owners. When economic conditions favour a 'buyers's market' why compromise? Why not demand terms that swing the risks more heavily onto the contractor, that protect the employer against the consequences of unforeseeable circumstances and that give him more control?

This approach is typified by many governmental contract forms and, in the private sector in Singapore, by the new (1980/82/87) SIA¹ forms.

Another compromise that is normally considered acceptable to both parties to a construction contract lies in the coverage of the contract terms. The form of agreement is required to perform two functions:

- * to serve as the evidence of the legal relationship between the parties (in contract), and
- * to provide for the administrative procedures necessary to the fulfillment of the legal relationship.

These are perhaps not clearly distinguishable but the most successful standard forms are those that, apart from serving their legal function, are regarded as regulating day to day relationships on site: they are written and presented in such a way as to be useful for easy reference by non-legal site and consultancy personnel. If the contract administrators understand their roles and responsibilities clearly, then circumstances which might otherwise lead to disputes are dealt with as matters of routine. The form of contract must fulfill this role in the absence of any other generally accepted codes of practice that could be incorporated into the legal relationship.

Thus the objectives of standard forms may be summarized as follows:

- (a) to define the scope of the work to be executed;
- (b) to define the sum(s) to be paid as consideration, or the formula by which that sum or sums may be determined;
- (c) in as much as the terms and conditions which would otherwise be impliable into the agreement by operation of law are considered inadequately detailed or wrongly biased, to modify such terms and conditions.
- (d) in as much as the contract might otherwise be construed as one of undesirably strict entirety², to modify the consequences of its entirety.
- (e) in as much as contractual relationships are governed by statute, to attempt to ameliorate these effects.
- (f) to impose such further specific conditions and procedures as may be deemed desirable, including those relating to the settlement of disputes.
- (g) to identify the officers of the contract and their roles and responsibilities.

The response by the sponsoring organizations to the documentary needs of the various sectors of industry has, however, been patchy and, in some areas, quite inadequate. The UK's Joint Contracts Tribunal (JCT) is perhaps leading the field and, in recent years, has produced several variant or special purpose forms. But, as an example of an area not well catered for, few standardized contract forms or procedures have been developed for maintenance and refurbishment projects outside the public sector housing agencies.

The property management sector will always suffer from the consequences of its own diversity. It embraces such a range of project types, both as to their nature and scale, that effective standardization of contractual terms is difficult to achieve. The standard form contracts that are available recognize the basic lump sum/ measure and value/ cost reimbursement distinction and the major work/ minor work range, but only limited combinations of these are provided for and many of the management problems peculiar to work within existing and occupied shells are ignored. The fact that standardization in a particular sector of work is difficult to achieve in no way makes it less desirable - especially where much of the work is commissioned by owners and managers without reliance on independent professional advice.

It is submitted that it would be of substantial benefit to property and project managers, and to the supply side of the industry, if an adequately comprehensive range of contractual arrangement options were to be commercially available, expressed in terms comprehensible to the non-lawyer, and with guidance notes as to their intended usage.

If new forms are to be developed, there appear to be three available approaches to the problem:

- (a) an extended range of standard forms
- (b) an adaptable form (or forms) on the FIDIC model
- (c) a 'core' set of general conditions, with 'add-on' modules for specific applications.

It seems unlikely that the JCT, or any other national equivalent body, will wish to produce the necessary range of options. The FIDIC form (in its recent Fourth Edition) addresses the problem of diversity in the requirements of international engineering projects by the adoption of a two-volume document: volume 1 provides those terms that are expected to be generally applicable, while volume 2 provides structure and guidance only for all the other terms necessary but likely to be affected by the project circumstances and type. These latter 'Conditions of Particular Application' are to be drafted ad-hoc and a presumption of the system is that the client has retained professional advisors capable of the necessary drafting work. That may be the case in international engineering but it is by no means always so in property maintenance. Even if it were, the system is fairly high-risk in terms of the opportunity for poor draftsmanship. All contracts prepared in-house, while intending to be geared to the specific needs of the project or of the particular organization, are likely to leave much to be desired in terms of drafting quality and hence in reliability.

Classification of users and uses

In the matter of adoption of standard form construction contracts, the demand comes from both buyer and seller sides of the industry. Contractors putting forward packaged proposals to a prospective client have just as much need of reliable contract terms as do employers in the more traditional arrangements, and contractors promoting their services may well perceive adoption of well-recognized forms to be a valuable marketing policy.

Analysis of the UK Unfair Contract Terms Act provides the following classification of contracts in terms of the situations in which they come into being:

- (a) contracts on standard forms proffered by the client (employer) in competitive tendering;
- (b) as (a) but without competitive tendering
 - (i) client dealing as consumer
 - (ii) client not dealing as consumer;
- (c) contracts on standard forms proffered by the contractor in competitive tendering;
- (d) as (c) but without competitive tendering
 - (i) client dealing as consumer
 - (ii) client not dealing as consumer;
- (e) contracts on informal or ad-hoc terms
 - (i) client dealing as consumer
 - (ii) client not dealing as consumer;
- (f) sub-contracts
 - (i) on standard forms
 - (ii) on informal or ad-hoc terms.

English consumer protection law distinguishes persons dealing as consumers as requiring a greater degree of protection in matters of unfair terms. The definition of consumer status

excludes any person adopting competitive tendering, and such status can also not exist at sub-contract level. In distinguishing the levels of statutory protection required, this classification scheme (other than by (e) therein) provides a useful view of the diversity of the situations in which standard form contracts are required, and this must lead to the conclusion that any attempt at an inflexible universal solution is doomed to failure. While the benefits of standardization must be harnessed, it must be within an highly adaptable framework.

The criteria for selection of contract type are primarily the nature of work, the availability of design information to the contractor at tender stage, and the basis for payment, these being strongly correlated in that the nature of work largely dictates the timing of its design and that in turn constrains the basis of tendering and the payment terms. Table 1 below provides a classification of work types (within the building sector only) for this purpose: civil engineering and the petrochemical industry have other variants.

Table 1 - WORK CLASSIFICATION SCHEME

1. Demolition; site clearance; site investigation; specialist foundation work done as a preliminary contract:
Mainly single trade work. Reliance on contractor's design is common.
 2. New buildings (or building superstructures):
Multiple trades. Provision for nomination of sub-contractors normally required. Normally pre-designed by consultants.
 3. Work packages (or specialist trades) forming part only of new buildings and let under direct contract arrangements:
Single or multiple trades; general or specialist work. Normally pre-designed by consultants.
 4. Minor Works:
Single trade or work gang involvement, eg redecorations and repairs; minor ancillary structures. Skill requirements range from low to specialist. Reliance on contractor's design is common.
 5. Alteration; adaptation; upgrading; refurbishment:
Concurrent or interdependent trades requiring coordination and management skills. Projects range from minor extensions to specialist retrofitting. Scope is normally determinable in advance of tendering: normally pre-designed by consultants.
 6. Restoration after fire damage; conservation:
Work of diverse and/or specialist nature. Design consultants normally required. Initial stripping out and exploratory work commonly required before scope can be determined.
 7. Repetitive project work:
As Types 2 or 5 above but applied to several (or many) units (or floors in multi-storey buildings) for which requirements are similar but often variable in extent. Design consultants normally required. Design commonly on a 'typical details' basis.
 8. Periodic or term maintenance:
Minor-works contractor to be on call on a continuing basis for any requirements at direction of a property manager. Alternatively, a delegated responsibility for execution of specified work as and when it becomes necessary.
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The available range of currently published standard forms reflects the 'payment basis' approach as the principal descriptor: the following classification scheme provides definition of the options on this basis:

- (a) 'lump sum' contractual packages - based on drawings and specification provided by the employer
 - i) where the risk of assessment of the work scope rests with the tenderer,
 - ii) where lacunae in the specification are at the risk of the employer;
- (b) 'lump sum' contractual packages - based on work schedule or Bill of Quantities provided by the employer
 - i) where the risk of assessment of the work scope rests with the tenderer,
 - ii) where quantification errors are at the risk of the employer;
- (c) 'lump sum' 'package deal' or 'design and build' arrangements; principal documentation prepared by the contractor on basis of contractor's proposals or quotation;
- (d) 'measure and value' or 'schedule' contracts - based on drawings, specification, schedule of rates, work schedule or Bill of Approximate Quantities provided by the employer or contractor;
- (e) 'cost reimbursement', 'cost plus' or 'prime cost' contracts - based on specifications and definitions of prime cost provided by the employer.

We are thus faced with a three-dimensional matrix for which the axes are:

- the situation in which the contract comes into being,
- the work type, and
- the payment basis on which the contract is to be founded.

The many possible permutations do not all represent likely combinations of requirements in practical terms and there is no doubt some commonality in the requirement arising in otherwise diverse circumstances, but it is clear that the industry is not being particularly well served at present by the narrow range of available printed forms. This is even more the case if one brings into consideration the additional contractual provisions required where the contracts are other than domestic (ie having an overseas element), and that, of course, is increasingly the case.

THE MODULAR CONTRACT SOLUTION

At CIB W70's Symposium in Singapore in March, the author proposed the modular approach as being particularly appropriate to documentation requirements in the property maintenance and refurbishment sectors. The modules then suggested are appended as Table 2 hereto. It is now further proposed that these modules could have a universal applicability within the building sector - the limitation to building being primarily a recognition of the different practices and terminologies in the civil and mechanical engineering sectors which would render draftsmanship in the building tradition unacceptable.

The modular contract is conceived on the building block basis. The user or his professional advisor would purchase a 'package' of printed standardized contractual terms, the terms being presented in groupings under descriptive 'module' headings, each module being on separate (possibly colour coded) pages. The commercially available package would contain all the proposed modules, those not required for a particular project being discarded.

The following notes describe the work being undertaken in the Construction Law Research Unit of the National University of Singapore. It is hoped that this work will come to fruition in the form of commercial publications in due course. Copyright is reserved.

The research background

The study of contracts and of contractual terms at NUS has concentrated on the techniques of risk allocation, their legal reliability and their significance for project management. Particular

Table 3 - CONTRACT DRAFTING MODULES

| Module description | Contractor's obligations | Employer's obligations |
|--|--|---|
| MODULES WHICH MUST BE INCLUDED IN ANY CONTRACT | | |
| 1. Articles of agreement (including Recitals, schedule of operative terms, identification of contract documents) | <ul style="list-style-type: none"> * Nature of (definition) * Option for design work * Optional requirement for personal performance * Compliance with legislation | <ul style="list-style-type: none"> * Provision of information * Provision of design * Provision of access * Payment |
| (Include one only of the Module 2 options) | | |
| 2A. Definition of scope of work obligation: basis of payment obligation | <ul style="list-style-type: none"> * Firm quantities provided | <ul style="list-style-type: none"> * Periodic payment * Measured basis of valuation * Rectification of discrepancies |
| 2B. Definition of scope of work obligation: basis of payment obligation | <ul style="list-style-type: none"> * Design and specification provided | <ul style="list-style-type: none"> * Periodic lump sum payment * Stage basis of valuation * Rectification of discrepancies |
| 2C. Definition of scope of work obligation: basis of payment obligation | <ul style="list-style-type: none"> * Specification provided | <ul style="list-style-type: none"> * Periodic payment * Measured basis of valuation per Schedule of Rates * Rectification of discrepancies |
| 2D. Definition of scope of work obligation: basis of payment obligation | <ul style="list-style-type: none"> * Specification provided | <ul style="list-style-type: none"> * Periodic payment * Prime cost basis of valuation * Rectification of discrepancies |
| 2E. Definition of scope of work obligation: basis of payment obligation | <ul style="list-style-type: none"> * Contractor's accepted proposals | <ul style="list-style-type: none"> * Periodic lump sum payment * Stage basis of valuation * Rectification of discrepancies |
| 3. Performance standards | <ul style="list-style-type: none"> * Contractor's supervision * Material and workmanship * Testing * Making good defects * Commencement and completion dates * Care of the works | <ul style="list-style-type: none"> * Approvals (significance of) * Acceptance on completion * Extension of time |
| 4. Employer's powers | <ul style="list-style-type: none"> * Directions as to method or timing of work * Variation to design * Nomination of suppliers or sub-contractors * Dismissal of employees | <ul style="list-style-type: none"> * Payment for variations * Payment for nominated accounts |
| 5. Indemnities | <ul style="list-style-type: none"> * Injury to persons * Damage to property * Royalties and patent rights | <ul style="list-style-type: none"> * Fire etc risks |

/contd.

Table 3 (contd.)

| Module description | Contractor's obligations | Employer's obligations |
|--|--|--|
| OPTIONAL MODULES | | |
| 6. Contract administration | | <ul style="list-style-type: none"> * Appointment and replacement * Function as employer's agent * Certification function * Measurement and valuation * Binding effect of certificates |
| 7. Sectional completion; partial possession | <ul style="list-style-type: none"> * Early hand-over | <ul style="list-style-type: none"> * Acceptance of risks |
| 8. Remedies for non-performance | <ul style="list-style-type: none"> * Retention fund or security deposit * Liquidated damages for delayed completion * Optional product warranties * Optional performance bond * Termination | <ul style="list-style-type: none"> * Termination |
| 9. Insurance | <ul style="list-style-type: none"> * Injury to persons * Damage to property | <ul style="list-style-type: none"> * Fire etc risks |
| 10. Interpretation: Resolution of disputes | | <ul style="list-style-type: none"> * Precedence rules * Law and language of contract * Arbitration |

Footnotes:

(1) Singapore Institute of Architects. The SIA forms introduced in 1980 and currently in their Third Edition, were originally drafted by eminent English QC Mr Duncan Wallace and are generally considered to be significantly biased in favour of the employer. See Nigel M Robinson, 'Standard Form Construction Contracts: Evolution or Revolution - the Singapore Experience', in the proceedings of CIB W55/65, March 1990, Sydney, Vol 3 pp 362-372.

(2) The English common law doctrine of entirety is to the effect that, unless otherwise stipulated or impliable in particular circumstances, entire completion is a condition precedent to the contractor's entitlement to be paid. The doctrine has several onerous consequences that are generally considered impracticable in the construction work context.

(3) Principal Researchers are Dr Martin Betts and Mr Nigel M Robinson; Research Assistant Mr Joseph Santanam.



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WORKING COMMISSION W92
**PROCUREMENT
SYSTEMS**

SYMPOSIUM
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ZAGREB
YUGOSLAVIA

"CONTRACTING IN YUGOSLAVIA"

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CONTRACTING IN YUGOSLAVIA

1. Introduction

Construction is a rather complicated process which directly or indirectly touches all fields of human activities. It covers various works and services provided by many people, from the initiation, studies, designing, building and civil works, supply and erection of equipment, to the takeover and use of the building. The process should be organized and it is regulated by numerous rules and norms of different nature. Some of these rules affect the technical correctness and quality of the works or of the building while the others are related to the persons and their mutual relationships, activities and behaviour. There is no one common name covering all the rules and norms applied in the construction process, but the term "construction law" can be used for this purpose.

Regarding legislation, the "construction law" can be divided into two categories:

- statute law,
- "autonomous law"¹ (non-statute or common law) and
- customs (unwritten law established by long use).

The statute law in Yugoslavia is made by legislature on three levels:

- federal,
- republican² and
- communal.

The "autonomous law" is, compared to the other European countries, rather undeveloped in Yugoslavia and covers some general conditions, standard methods and codes of practice, which are still not widely accepted and used.

Considering the procurement procedures and their legal aspects, there are two parts which should separately be discussed:

- tendering and
- contracting.

¹ The term "autonomous law" is commonly used in Yugoslavia and denotes all rules made by entities other than the state.

² for this purpose "republican" also means "provincial"

These procedures are covered partly by the federal and partly by the republican legislation, but the "autonomous law", which should cover the most of these procedures, is not developed in Yugoslavia.

2. Statute law

The Yugoslav federal Constitution³ determines the legislation of statute law of all kinds, as well as of the "construction law". There are two construction-related fields of law that have their sources on the federal level:

- system of measures, technical rules and standard specifications,
- law of obligations.

The capital federal act affecting the construction process is the Law of Obligation Act which constitutes a part of the civil law. The act covers the matters of the contract law and defines, in the chapter 8, the construction contract.

All other regulations are made on the republican or communal levels. The legislative on republican level cover:

- spatial development⁴,
- construction law,
- use of land.

Although each republic prepares its own "construction law", there are no essential differences in the solutions of the main problems regarding the rules. The regulations concerning the construction process, made by the republican legislature, include the following issues:

- content and procedure of preparing investment studies,
- designing and engineering works,
- building permit,
- tendering procedures,
- quality of material and works,
- duties and powers of the employer and the supervisor,
- duties and powers of the contractor,
- documents to be kept on the site,
- warranties,
- duties and powers of communal inspection,
- takeover,
- permit for use of the building.

³ *The Constitution and its amendments*

⁴ *These issues are dealt with on the both republican (norms) and the communal (execution) levels.*

The legislative on communal level deals mainly with spatial planning and determines shape and disposition of buildings in accordance with the local, climate and other conditions as well as with the tradition.

It should be noted that all the norms made to this date, at all levels, have been in accordance with the self-management system and with the so called "social resources"⁵. Because the legal entities are not owners of the "social resources", the legislature has fully determined how to deal with investments and what are the duties of all parties included in the construction process. It is one of the reasons why the "autonomous law" has not been developed in Yugoslavia.

This field was also influenced by the recent political⁶ and economic reforms and changes in Yugoslavia. It is expected that the new legal system will give more power to the enterprises and to all entities included in the construction process, which will enable them to act as independent and responsible bodies, while at the same time the role of the state and its authorities will be diminished.

3. Autonomous law

The "autonomous law" is usually made by the professional associations, such as associations of civil engineers or similar bodies, chambers of commerce, groups of investors or by big employers. This kind of law is not developed in Yugoslavia. One of the reasons, as mentioned above, has been the firm and overweighted role of the state in the construction process. The second reason has been the lack of strong associations of consultants⁷ and contractors, which should be the subjects that are the most interested in creation of the "autonomous law".

The Yugoslav Chamber of Economy issued Tender Documents for Civil Engineering Works, prepared by the Civil Engineering Institute, but these documents have not as yet been widely accepted. Also, the Association of Consulting Engineers of Yugoslavia is preparing the General Conditions of Contract for Consulting Services. There are some other attempts aiming at the further development of this field, but they will have a chance to succeed only after the change of the economic system.

⁵ *The term "social resources" has no equivalent translation in English*

⁶ *The political changes have already taken place in Slovenia and Croatia, and they are also expected on the federal level.*

⁷ *There is the Association of Consulting Engineers of Yugoslavia as a member of FIDIC, but its role and influence is very limited*

4. Tendering

Although there are small differences in defining some of the terms or the parts of the tendering procedures, the statute law in all republics determines three methods of tendering:

- open tendering
- selected tendering
- negotiated tender

An employer has a freedom in choosing the method of tendering he may consider the most appropriate for his purposes, but he cannot choose a procedure of negotiated tender, except in a very limited number of cases.

When applying the selected tendering procedure, the employer can select the tenderers using two possible ways:

- direct selection,
- prequalification of tenderers.

Some of republic regulations do not allow the first way of selecting, which provides less freedom for the employer and for which more time and money is required to finish the whole procedure before the signing of the contract. As for the open tendering, it is prescribed that the call for tenders should be announced in an official gazette or in daily newspapers.

There are more differences in determining the detailed tendering procedure. The procedure is regulated through various norms. Some republics have included it in the Law of Construction Act, and the others in the by-laws to such an act. The differences are mainly in:

- the prescribed way of announcing the tendering,
- objects of tendering,
- content of tender documents and
- the procedure of valuation of tenders.

Significant differences exist in the terminology used by law makers in various republics, particularly in the definitions of the terms "engineering"⁸ and "consulting". The definitions used in most norms do not correspond to the definition of these terms as used in the international practice. The fact is that there is no reason why these terms should be defined through the construction-related statute law. They should be defined in the norms regulating business activities, that can be registered by a legal entity at the registration court.

⁸ The term "engineering" is often used in Yugoslavia to describe all works and services for a project to be executed on a "turn key" basis.

The object of tendering can be:

- building and civil engineering works,
- supply of plant and equipment,
- erection of plant and
- consulting services.

These objects are not strictly determined by the law and an employer can make any combination of these objects. Tenders can also be called for all the works and services needed for the completion of the construction on a "turn key" basis.

As for the criteria for comparison of the tenders and for selecting the most suitable tenderer, the employer has a freedom of choice of the most appropriate criteria that correspond to his needs. The firm submitting the lowest price is usually, but not necessarily, awarded the contract. The only prescribed condition is that the employer must announce the criteria to be used in comparison of tenders as prescribed in the federal Law of Obligations Act. If the employer does not announce the criteria when calling for tenders, he must award the contract to the firm that has submitted the lowest price.

If the employer so wishes, the tenders could be accompanied by the tender guaranties. The tenders are usually opened, examined and compared by the committee nominated by the employer. The methods and procedures of this work are not prescribed, but the minutes of opening of tenders should be kept including all relevant facts related to the prices and other conditions. The selected firm should be notified in writing and should be called for signing of the contract.

5. Contracting

A contract is usually defined as a legally binding agreement between two or more parties. While every contract is based on an agreement of the parties, not every agreement between parties is necessarily a contract. An agreement can be a contract only if it has legal consequences. This intention should possibly be deduced from the type of agreement or from the general circumstances in which the agreement has been entered into. To avoid misunderstandings in determining the nature of an agreement, some types of agreement, which are deemed to be a contract, are regulated by law. The same applies to the contracts concluded between parties in a construction process.

Regarding the object of a contract, there are several types of contracts which can be entered into by the parties in a construction process. They are:

- construction contract,
- contract for supply of plant and equipment,

- contract for erection of plant,
- contract for consulting services,
- "turn key" contract,
- other contracts.

The contract law is a part of the Yugoslav federal Law of Obligations Act. This act defines only construction contracts. The act also mentions a "turn key" contract without determining deeper its content. Other types of contracts are not named and their nature should be determined from their content.

A construction contract must be in written form and must have three essential parts:

- object of the contract,
- contract price and
- time for execution of the contractual works.

In its general parts, the Act provides methods according to which contract price can be determined. The price can be determined in a contract as

- a lump sum and as
- unit prices (BDQ contract).

There are no objections regarding the use of cost reimbursable contracts, but they are not used in Yugoslavia mainly because of financial regulations, which require that the cost of an investment should be determined and accepted before execution of a project. The new reform that is currently being realized in Yugoslavia, will give more freedom to the enterprises also in this field, and it can be expected that cost reimbursable contracts will be used in Yugoslavia.

6. Conclusions

This overview of contractual procedures in Yugoslavia is written in the wrong time. Yugoslavia is facing radical political and economic reforms and some of the regulations and procedures described in this paper will be changed. These changes will introduce a free market in all economic sectors, and private enterprises will have more influence upon the national economy. Enterprises, both state owned and private, will have more freedom in their investment policy. It means that the construction law will also be changed, diminishing the role of statute legislation and enhancing development of the "autonomous law".

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**"A RATIONAL PROCEDURE FOR
THE SELECTION OF
APPROPRIATE PROCUREMENT
SYSTEM"**

**DR SURINDER SINGH
UNIVERSITY OF SINGAPORE**



GRAĐEVINSKI INSTITUT

A RATIONAL PROCEDURE FOR THE SELECTION OF APPROPRIATE PROCUREMENT SYSTEM

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INTRODUCTION

Construction works of all types account for about half the total outlay of any Plan for development. The building construction alone accounts for almost half the expenditure. This enormous expenditure of about 25 per cent of Plan allocation on building construction emphasises that the resources should be utilized in the most economical way.

One of the important factors for the effective utilization of resources is the appropriate organization structure/contracting system employed for the execution of building projects.

Construction works in almost every country are executed through contractors on the basis of open competitive/negotiated tendering; the type of contracting employed varies from one country to another and even within the same country, many a times, different organisations follow different systems such as lump sum contract, design and building (construct) contract, cost plus percentage contract, turnkey contract, professional construction management process etc. for the same type of construction project. In view of this, it is felt that the standardization of practice for different situations is necessary in order to achieve satisfactory completion and economy in construction.

This paper discusses the possible alternative approaches, the approach adopted, the contracting systems investigated, the variables considered and describes a rational procedure for the selection of appropriate project delivery system for building construction projects. The procedure is based on the weightage factors and priority rating for project attributes (variables) like speed, certainty, flexibility, quality, complexity, etc.

The relative weightage factors for different contracting systems have been established in the States using the expertise/experience of highly placed

professionals in the building construction industry.

ALTERNATIVE APPROACHES

Broadly, the problem could be tackled by two alternative approaches. In the first approach comparative performance of different contracting systems could be investigated on quantitative basis based on the historical records of numerous completed projects (4) and from this one could establish different situations under which a specific type of contracting system is most appropriate. Alternatively, one can establish procedure for rational procurement decision analysis based on the multi-attribute technique (2). In this approach one needs to establish utility (weightage) factors for projects' attributes like speed, certainty, flexibility, quality, complexity, risk avoidance and responsibility, price competition, disputes/arbitrations etc. for each type of contracting system. The weightage factors (2,3) can be established using the expertise/experience of professionals and without reference to the records of completed projects. Having established the required weightage factors for different attributes and contracting systems, an individual user who is keen to select an appropriate contracting system for a given project needs to give priority rating to different attributes using a suitable scale. The consideration of weightage factors and priority rating leads to the selection of appropriate contracting system.

Experience has shown that the second approach mentioned above is less cumbersome, does not require the historical past records of completed projects and does lead to the selection of appropriate contracting system for a given project. It was therefore thought worthwhile to follow it for establishing the rational procedure for the selection of appropriate project delivery system for building construction projects.

CONTRACTING SYSTEMS/PROJECT DELIVERY SYSTEMS/PROCUREMENT METHODS

Based on the practice in the United States of America, nine undermentioned project delivery systems were considered for investigation. These were the systems which were found to have been used frequently in the past few decades in different regions of the country.

- * Negotiated lump sum (A)
- * Competitive lump sum (B)
- * Negotiated design and build (C)
- * Competitive design and build (D)
- * Negotiated turnkey (E)
- * Competitive turnkey (F)
- * Construction Management (G)
- * Unit rate and (H)
- * Cost plus fee (I)

VARIABLES CONSIDERED FOR WEIGHTAGE FACTORS

In all, eight variables were considered for establishing the utility factors. These are as follow:

- * Speed (both during design and construction)
- * Certainty (including the reliability of both the original price and the stipulated time and knowledge of exactly how much the client has to pay at each period during the construction phase)
- * Flexibility (in accommodating design changes)
- * Quality level (including aesthetics, confidence in design and flexibility in accommodating design input by the client)
- * Complexity
- * Risk avoidance and responsibility (including client involvement and design liability)
- * Price competition (covering such issues as value for money, maintenance costs and competitive tendering) and
- * Disputes and arbitrations

COLLECTION OF INFORMATION REGARDING WEIGHTAGE FACTORS

A questionnaire was developed (Appendix) to collect data so as to establish the relative values of weightage factors in respect of variables. It can be seen from this appendix that a scale of 10-110 was adopted for each of the variables considered so as to give a good flexibility (to those filling the questionnaire) in marking the relative performance of different contracting systems.

The questionnaire was circulated to 100 highly placed and experienced professionals in the building construction industry with a request to mark personally the relative performance of different procurement methods in respect to each variable. In all 35 filled-up questionnaires were received back and these were used for establishing the weightage factors.

Each professional was assured that the information filled by him in the questionnaire will be kept confidential and will be used only for research purposes.

ESTABLISHING WEIGHTAGE FACTORS

Based on the 35 replies received, the results were analysed and averaged so as to arrive at weightage factors in respect of each variable considered. The averaged values in respect of various parameters are given in Table 1.

Table 1: Average Values of Variables for Different Delivery Systems

| Variable | Project Delivery System | | | | | | | | |
|---------------------------------|-------------------------|------|------|------|------|------|------|------|-----|
| | A | B | C | D | E | F | G | H | I |
| Speed | 67.9 | 47.7 | 95.0 | 73.3 | 86.1 | 68.4 | 76.1 | 62.6 | 737 |
| Certainty | 92.3 | 90.9 | 81.6 | 81.9 | 79.5 | 78.7 | 65.9 | 37.9 | 391 |
| Flexibility | 58.9 | 44.6 | 70.9 | 58.2 | 58.1 | 52.9 | 84.5 | 87.0 | 966 |
| Quality Level | 75.8 | 70.9 | 68.4 | 63.2 | 65.5 | 58.6 | 81.6 | 65.0 | 856 |
| Complexity | 93.7 | 91.3 | 83.5 | 81.1 | 73.5 | 72.4 | 63.2 | 51.5 | 517 |
| Risk Avoidance & Responsibility | 76.0 | 79.1 | 79.1 | 82.6 | 75.6 | 79.0 | 63.3 | 33.9 | 396 |
| Price | | | | | | | | | |
| Competition | 76.7 | 99.3 | 67.6 | 84.7 | 64.1 | 77.0 | 64.0 | 41.3 | 447 |
| Disputes & Arbitrations | 94.2 | 84.8 | 81.8 | 73.6 | 72.8 | 66.9 | 65.9 | 56.1 | 588 |

A RATIONAL PROCEDURE FOR SELECTION

A rational procedure for the selection of appropriate project delivery system is illustrated in the decision chart (Table 2).

The decision chart is intended to be completed as follows:

- * The user reads all the priority questions and enters the relative importance of each variable in the chart on a scale of 1 to 20.
- * Rationalized priority ratings are computed (by dividing each of the priority ratings by the sum of all the ratings), and then entered into the chart. The sum of the rationalized priority ratings should always be equal to 1.
- * Each rationalized priority rating is taken in turn and multiplied by each of the utility factors, the results being entered into the appropriate columns.
- * The totals of each of the result columns, under each project delivery system, are calculated and ranked in the descending order. The best project delivery system should have the highest total result.

The decision chart for a hypothetical project viz. an industrial building to commence production as soon as possible is given in Table 2.

The computations made in Table 2 indicate that a negotiated design and build contract is the best to be adopted under the given situation.

STATISTICAL TEST

In averaging the weightage scores it was assumed that a reasonable level of consistency exists between these scores. If, however, these scores were insufficiently consistent the results obtained may have been wrong. In order to obtain a measure of consistency a statistical test was performed using the

Table 2: Decision for a Hypothetical Project Viz. An Industrial Building to commence production as soon as possible

| Clients priority questions | Client's priority rating (scale 1-20) | Rationalized priority rating | Project Delivery Systems | | | | | | | | | | | | | | | | | |
|--|---------------------------------------|------------------------------|--------------------------|--------|------------------------|--------|-----------------------------|--------|------------------------------|--------|----------------------|--------|-----------------------|--------|---------------------------|--------|----------------|--------|-----------------|--------|
| | | | A Negotiated Lump Sum | | B Comparative Lump Sum | | C Negotiated Design & Build | | D Competitive Design & Build | | E Negotiated Turnkey | | F Competitive Turnkey | | G Construction Management | | H Unit Rate | | I Cost Plus Fee | |
| | | | Utility factor | Result | Utility factor | Result | Utility factor | Result | Utility factor | Result | Utility factor | Result | Utility factor | Result | Utility factor | Result | Utility factor | Result | Utility factor | Result |
| 1. SPEED How important is early completion to the success of your project? | 20 | 0.21 | 67.9 | 14.3 | 47.7 | 10.0 | 95.0 | 20.0 | 73.3 | 15.4 | 86.1 | 18.1 | 68.1 | 14.4 | 76.1 | 16.0 | 62.6 | 13.2 | 73.7 | 15.5 |
| 2. CERTAINTY Do you require a firm price and/or a strict completion time date for the project before you can commit yourself to proceed with construction? | 18 | 0.19 | 92.3 | 17.5 | 90.9 | 17.3 | 81.6 | 15.5 | 81.9 | 15.6 | 79.5 | 15.1 | 78.7 | 15.0 | 65.9 | 12.5 | 37.9 | 7.2 | 39.1 | 7.4 |
| 3. FLEXIBILITY To what degree do you foresee the need to alter the project in any way once it has begun on site? | 5 | 0.05 | 58.9 | 3.0 | 44.6 | 2.2 | 70.9 | 3.6 | 58.2 | 2.9 | 58.1 | 2.9 | 52.9 | 2.7 | 84.5 | 4.2 | 87.0 | 4.4 | 96.6 | 48.8 |
| 4. QUALITY LEVEL What level of quality, aesthetic appearance do you require in the design and workmanship? | 7 | 0.07 | 75.8 | 5.3 | 70.9 | 5.0 | 68.4 | 4.8 | 63.2 | 4.4 | 65.5 | 4.6 | 58.6 | 4.1 | 81.6 | 5.7 | 65.0 | 4.6 | 85.6 | 6.0 |
| 5. COMPLEXITY Does your building need to be highly specialized, technologically advanced or highly serviced? | 3 | 0.03 | 93.7 | 2.8 | 91.3 | 2.7 | 83.5 | 2.5 | 81.1 | 2.4 | 73.5 | 2.2 | 72.4 | 2.2 | 63.2 | 1.9 | 51.5 | 1.6 | 51.7 | 1.6 |
| 6. RISK AVOIDANCE AND RESPONSIBILITY To what extent do you wish one single organization to be responsible for the project or to transfer the risks of cost and time slippage? | 17 | 0.18 | 76.0 | 13.7 | 79.1 | 14.2 | 79.1 | 14.2 | 82.6 | 14.9 | 75.6 | 13.6 | 79.0 | 14.2 | 63.3 | 11.4 | 33.9 | 6.1 | 39.6 | 7.1 |
| 7. PRICE COMPETITION Is it important for you to choose your construction team by price completion, so increasing the likelihood of a low price? | 10 | 0.11 | 76.7 | 8.4 | 99.3 | 10.9 | 67.6 | 7.4 | 84.7 | 9.3 | 64.1 | 7.1 | 77.0 | 8.5 | 64.0 | 7.0 | 41.3 | 4.5 | 44.7 | 4.9 |
| 8. DISPUTES AND ARBITRATIONS To what extent do you want to avoid disputes/arbitrations? | 15 | 0.16 | 94.2 | 15.1 | 84.8 | 13.6 | 81.8 | 13.1 | 73.6 | 11.8 | 72.8 | 11.6 | 66.9 | 10.7 | 65.9 | 10.5 | 56.1 | 9.0 | 58.8 | 9.4 |
| Totals | 95 | 1.00 | 80.1 | | 75.6 | | 81.1 | | 76.7 | | 75.2 | | 71.8 | | 69.2 | | 50.6 | | 56.7 | |
| Rank Order | | | 2 | | 4 | | 1 | | 3 | | 5 | | 6 | | 7 | | 9 | | 8 | |

ranking obtained, from the data of each project delivery system for each variable. The results of this test indicated proper consistency between the scores.

CONCLUSIONS

The model (decision chart) designed and illustrated in this paper provides a rational procedure for the selection of appropriate contracting system for a given project for building clients.

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**"CONTRACTUAL ARRANGEMENTS
FOR RESIDENCES BUILT FOR THE
FREE HOUSING MARKET IN
VOJVODINA"**

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CONTRACTUAL ARRANGEMENTS FOR RESIDENCES BUILT FOR THE FREE HOUSING MARKET IN VOJVODINA

INTRODUCTION

Residential construction is developed in the framework of the governmental regulations of a given country, and such regulations differ from country to country. Each country attempts to solve the problems of apartment and apartment building construction with policies and systems of residential construction, with the social system and short term needs as a starting point.

Both state and individual residential construction have been in a period of crisis in Yugoslavia for quite a while. The intensity of investment in this area has weakened considerably in the last decade. The allocation of funds for residential construction from the gross national income has been significantly reduced (to almost one-half), investments in residential construction are down almost 30%, and the number of apartments built in 1988. as compared to 1980. was also down 13%. The cost amount of property outfitting has significantly increased in the price of apartments, see [4].

It is a historical fact that in times of crisis and misunderstanding the construction industry can come to a standstill, but it is also a fact that this never lasts long because the basis of industrial development and the living needs of people are dependent on construction. In every economic crisis, construction is the first to suffer restrictions, but it is also true that throughout history, construction and public works have been means of pulling out of crisis and solving the problems of unemployment.

The organization of apartment construction, especially state-owned, has changed many times in Yugoslavia recent times. This is the end of the period in which so-called "state directed residential construction" has been dominant; it has also been evaluated as unsatisfactory as far as total results are concerned. New forms of organizing residential construction, in the first place by means of residential cooperatives and more and more by means of free market construction, are suppressing the former systems of the organization of residential construction.

However, both in Vojvodina and in Novi Sad, both forms of organization and contracting for residential buildings still exist. "Directed residential construction" is a reflection of earlier relationships and means of work in this field, and the second represents one way of free market construction which is gaining more and more momentum. However, although contractual arrangements for residential construction is a known category, there are considerable difficulties because of former relationships in this field.

The goal of this paper is to point out some of the pertinent problems which appear during the contracting phase of apartments for the free market using the example of apartment construction in the MONTASTAN system. By getting around these problems, certain phases of residential construction can be significantly improved.

1. The Residential Market and the Means of the Organization of Construction in Vojvodina and in Novi Sad

It is evident that residential construction in Yugoslavia is more and more connected to the market, and that probably in the very near future it will be completely connected to it. Construction, like every other kind of production, should use its resources: knowledge, work force, materials, equipment, time and money. In approaching the usage of these resources, an investor (buyer), a designer, a builder, a supplier and a user all take part in the process. Under good market conditions, the participants in the construction are in direct contact, which enables each participant in the construction the satisfaction of his own interests and the advancement of his work, that is his productivity. Even so, the societal framework has a crucial role in the development of this productivity.

The existence of more than one form of organization and contracting for residential construction (i.e. directed residential construction, free market construction) somehow causes problems, especially in the area of financing. Socially directed residential construction still requires large amounts of money, and by that it leaves little room for the development of free market construction, especially when credits are in question. Construction companies, as the bearer (organizer) of free market construction, come into conflict with a series of difficulties during the contracting phase, and also in the construction phase, beginning with the securing of money for construction, through the process of finding a construction site and the dividing up of the building site into its various areas of usage, all the way up to the sale of the apartments, that is, price setting which must be competitive. It must also meet deadlines which should be as short as possible.

TABLE 1. Residential Building in Novi Sad¹⁾ in 1988. and 1989. According to the Means of Construction Organization

| Means of construction Organization | Number of Completed Apartments ²⁾ | |
|---------------------------------------|--|-------|
| | 1988. | 1989. |
| 1. Directed Residential Construction | 341 | 263 |
| 2. Market Construction | 335 | 486 |
| - construction companies | 316 | 252 |
| - residential cooperatives | 19 | 234 |
| - other subjects | / | 96 |
| Totals: | 676 | 845 |

¹⁾ Data source: Documentation of SIZ for housing, Novi Sad

²⁾ Residential building except individual construction

TABLE 2. Residential Construction in the MONTASTAN System - "1.MAJ" - Bačka Topola¹⁾, According to Means of Construction Organization

| Means of construction Organization (Buyers) | Number of Completed Apartments | |
|---|--------------------------------|-------|
| | 1988. | 1989. |
| 1. Directed Residential Construction | 150 | 30 |
| 2. Market Construction - Individuals | 95 | 95 |
| - Companies and Organizations | 199 | 123 |
| 3. Investment Construction ²⁾ | / | 120 |
| Totals: | 444 | 368 |

¹⁾ Data source: Internal documentation of GIK "1.MAJ" - B. Topola

²⁾ Construction according to special orders

By data analysis, given on Tables 1 and 2, where apartments in Novi Sad and Vojvodina are shown (for the MONTASTAN system), it can be seen that the number of apartments built in 1989. was significantly increased, in favor of the construction market, and that directed residential construction slowed down, but that it still exists.

With the goal of researching the existing forms of construction organization which exist today in Vojvodina, Model 1 was created. From it one can see the precisely given process of contracting and constructing apartments, adapted to the contracting and constructing of apartments for the MONTASTAN system. This presentation will also present a more detailed observation of some of the phases of construction (and contracting), in order to suggest eventual improvements in this complicated process.

2. The Procuring of a Building Site and the Organizing of the Construction Site in the Free Market Construction of Apartments

In the period after the Second World War in Yugoslavia, several industrial and institutional reforms were introduced (with varying success) which influenced the main changes in the policies of city land usage. These reforms could be characterized in the following way, according to [6]:

- The period of more or less centralized, planned industry (until 1965), in which the prices of land usage were defined by the laws of the state, independent of local needs;
- The period of adopting certain elements of a market economy (1965-1972), in which stateowned apartments and the infrastructure of cities was relatively independent of firms;
- The period after 1972, the period of radical constitutional

reform, in which the instruments of city land policy were defined by contracting and in direct confrontation with producers and consumers. In this period it was not the market, but special self-management agreements which determined the framework of city land policies.

The most recent period is characterized by important changes in finance policies for residential buildings, which should basically be founded on market principals and the engagement of the personal finances of citizens. The financing of the municipal infrastructure should be solved as a special and independent segment, which has its own financing and its own sources. A system of financing for municipal outfitting of building sites must be devised in order to separate the price of apartments from costs which should not be a part of that price. These solutions must be sought on various economic bases.

However, the situation is still such that the costs of outfitting construction sites are directly fed into the price of apartments, regardless of the fact that residential construction is increasingly founded on free market principles.

Certain changes have begun, especially in the way municipal properties are let out for usage, and now they are let out by competitive bidding (auction) or by direct agreement. Although it seems that the procedure for the letting of properties for usage by bidding has not gotten its final, solid form and precisely defined criteria for the choice of the user, it represents one of the new ways of working and an attempt that some elements of the market be included in the beginning phase of construction (the scope of the participation in the costs of the outfitting of site, the payment schedule, the going price for square meter of apartment space, the fixed construction costs, etc).

If the offered changes are understood as a transitional form on the way to the market definition of relations in the municipal organization of properties, then they should be accepted. From the present outlook, they may contribute to larger and more complicated administration, to the slowing down of construction deadlines, and just by that to growing prices of already high-priced apartments.

Construction firms which are awaiting for the bidding procedure to be introduced, lose their tempo, and unemployment capacities compounded by other troubles (nonliquidity, lack of jobs) only worsen this crisis period.

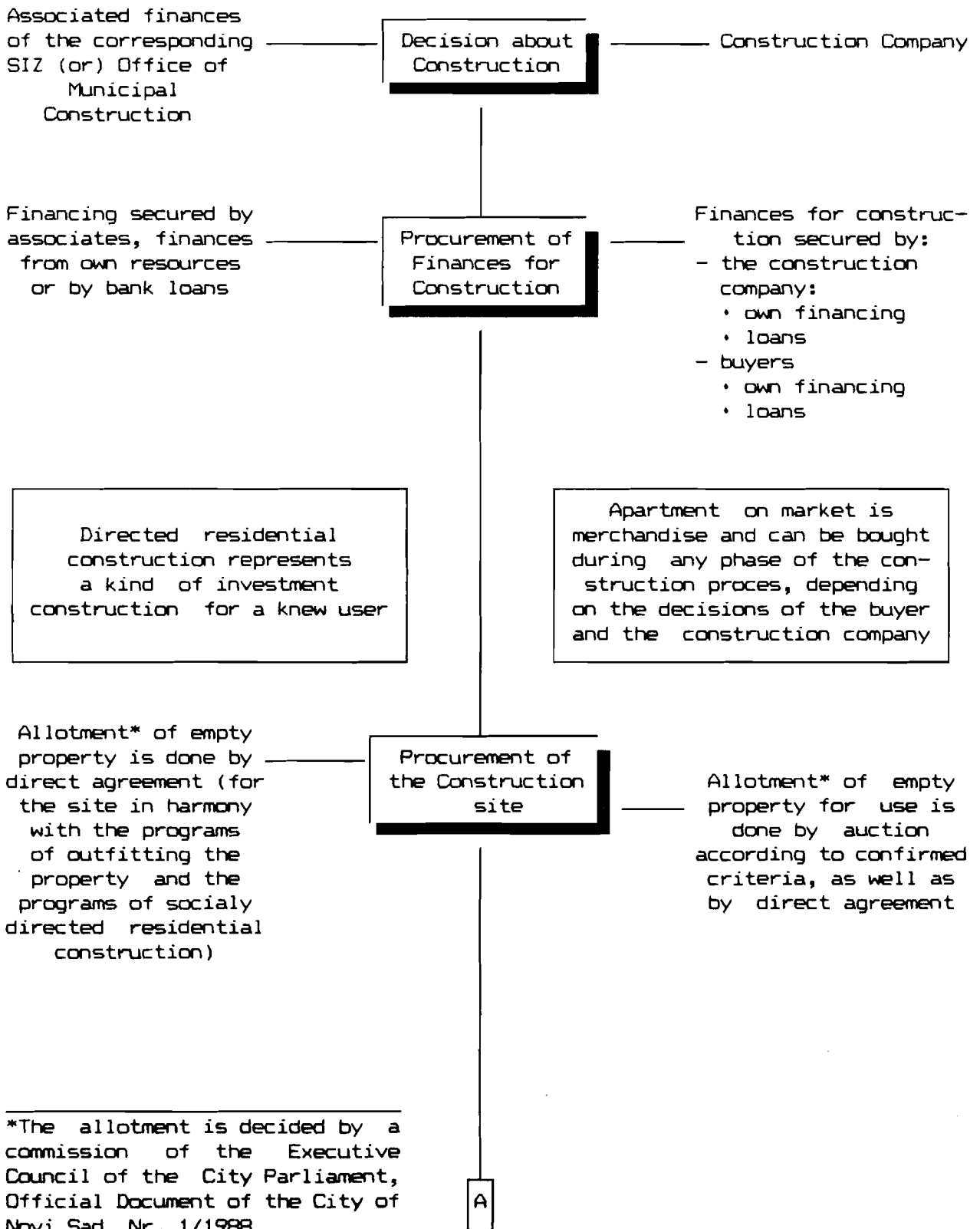
Perhaps the solution should be sought in the ceding of part of the work involved in outfitting construction lands to companies who carry out residential construction, so that they could outfit the property with their own organization and according to their own prices which are often lower. The secondary infrastructure network in residential blocks should be also included and constructed by the companies carrying on residential construction, as it has done since 1962. during a certain period. A part of the municipal infrastructure would still be under the jurisdiction of the Office of Municipal Construction, and the concrete costs of organizing sites would depend on the particular residential construction. In this way, the procedures would be at least partially simplified, the total construction costs would be

MODEL 1. The Construction and Contracting Process of Apartments in the MONTASTAN System - According to the Principles of "Directed Residential Construction" and Residence Construction for the Free Market in Vojvodina

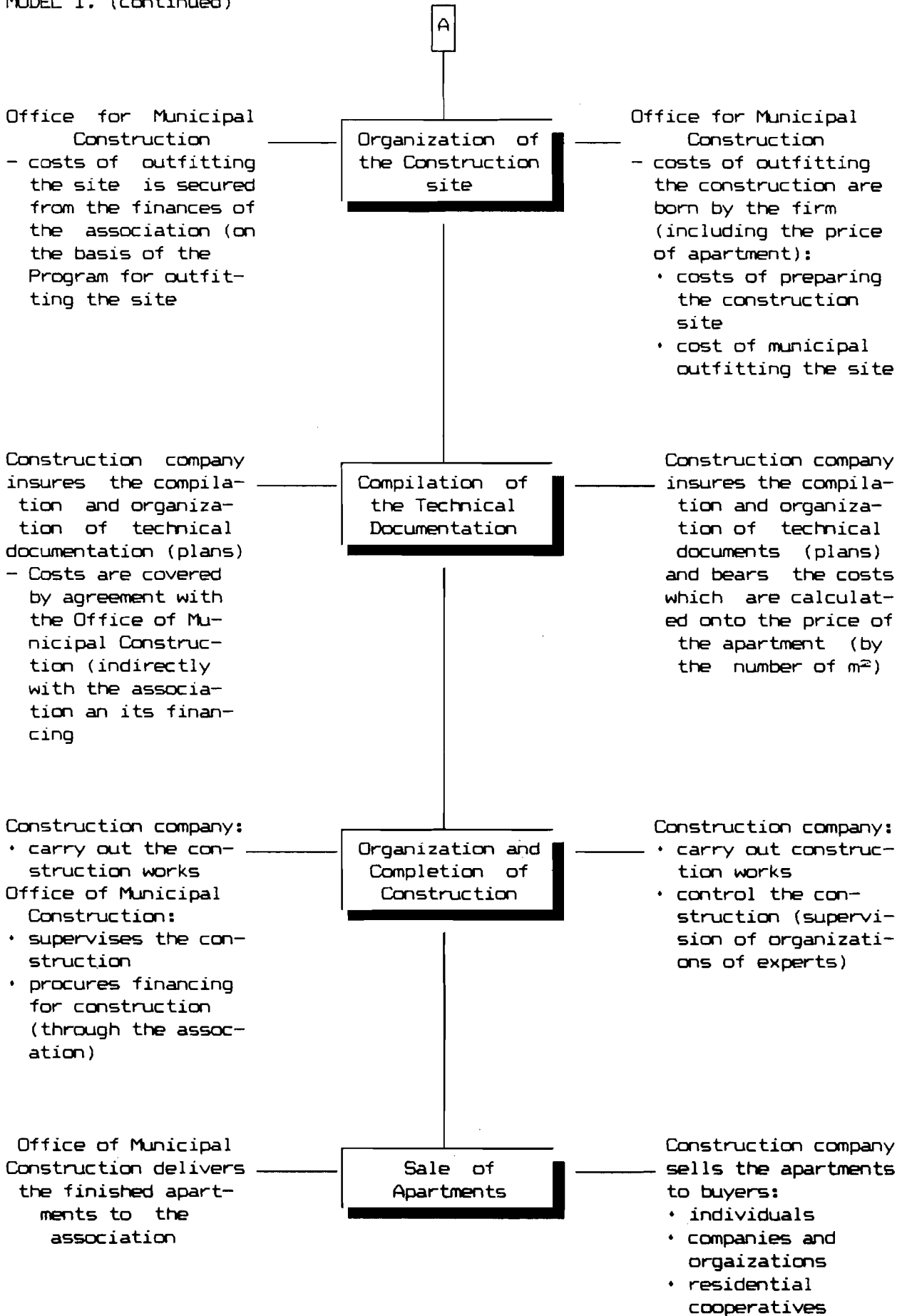
DIRECTED RESIDENCE CONSTRUCTION

THE CONTRACTING AND CONSTRUCTING PROCESS

FREE MARKET CONSTRUCTION



MODEL 1. (continued)



lowered, and finishing deadlines for constructions would be sped up. Construction companies would be better able to plan and organize their own capacities.

3. The Compilation of Technical Documentation, the Organization and Construction of Apartments in the Commercial Construction System

In the system of a free construction market, construction companies obtain and organize the technical documentation (the building plans) on the basis of the site in question, and they bear the costs which are related to those plans, calculating them into the price of apartments according to the number of square meters. The situation is most simple inasmuch as the company works out its own plans for the constructions they are building, meaning that they are using their own building system. Insofar as they hire out a part of the project and the plans to another design company, they need immediate financial resources, an agreement about each phase of the planning and strictly observed deadlines.

The company GIK "1. MAJ" in Bačka Topola builds apartments in their own system, MONTASTAN. Their organization for the design of one residential site may have the flow presented in Model 2. Planning and building within their own system, the company creates a series of concessions, it can be especially good about meeting its construction deadlines, and in that way it can decrease prices of its products on the market. If the company works together with other planning firms, contracting part of the planning work to them, the designers in that firm must be familiar with the construction system and technology which GIK "1. MAJ" uses in building. The process of planning by catalogue is not included in the diagram, and it should be the basis for further research.

Besides planning, this construction company organizes and carries out the actual building. This phase mostly depends on the company itself, its organization and job efficiency. Perhaps only in this phase we seek unobjectively for reserves, beginning with construction deadlines and ending with the price of an apartment.

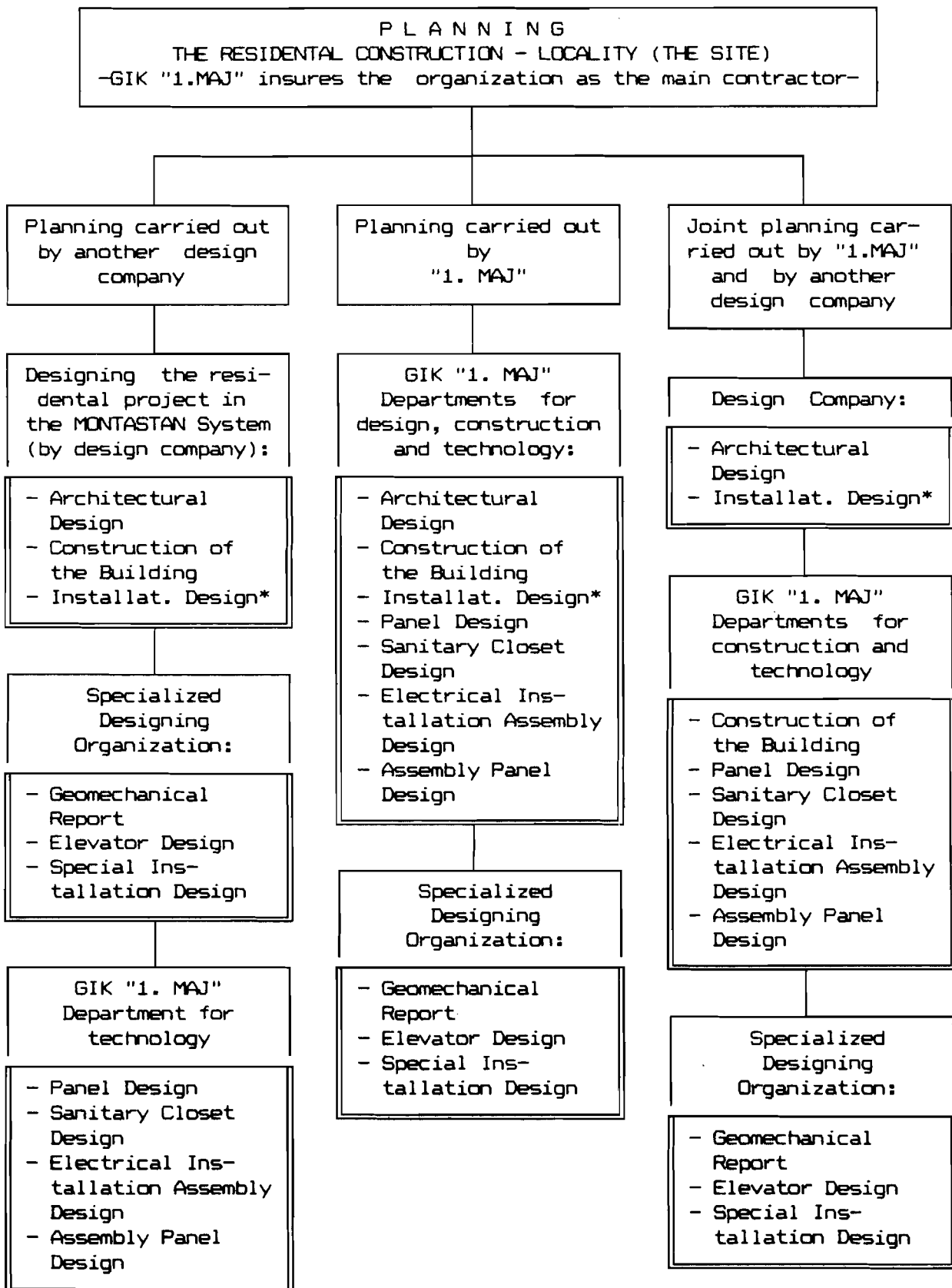
4. The Financing and Sale of Apartments on the Free Market

An apartment is merchandise in market construction, and thus purchasing can be done in any phase of the construction process, depending on the decisions of the construction company and the buyer. The purchaser and the construction firm sign a sales contract about the particular residential unit, which is precisely defined by the plans. In this way, the buyer purchases an apartment with which he is familiar.

Because the means for construction are obtained by the construction company (their own financing, loans) and the buyer-individuals, other companies and organizations (institutions), and residential cooperatives which are a group of buyers (with their own finances and loans) - the company must secure financing of the project through commercial banks if they decide to sell the residences in the later phases of construction.

In this phase, the financing of constructions faces a series of

MODEL 2. The Process of Compilation of Technical Documentation (plans) for Residential Construction in the MONTASTAN System



*Installation design includes design of the installations: plumbing and sewage, electrical installations, central heating and other standard installations.

unsolved problems, especially in the domain of loans and high rates of interest, for both buyers and construction company. We have witnessed the rather unusual (for our market) phenomenon of construction firms offering a "summer sale" on the price of apartments under the condition that the payments are made within a predetermined deadline. This fact shows that the market is partially functioning, but also that there are a series of unresolved relationships in that market.

5. Construction Deadlines in the Process of Contracting and Constructing Apartments for the Market

The process of contracting and constructing apartments for the market is a complex one in which a series of participants take part in the construction along with the construction company, such as: the Office of Municipal Construction, other planning organizations, other construction companies, firms who carry out the outfitting of the municipal infrastructure and other contractors. The construction deadline depends on the construction company who is building the building, but it also depends on the deadline for preparation of the construction site in the beginning phases of construction and, in the final phases, on the deadline of outfitting the property, that is the connecting of the site to the municipal infrastructure systems. Missed deadlines often occur in both of the mentioned phases of outfitting the property.

The construction company has little to no influence on these deadlines. The final construction deadline is often unjustifiably (or justifiably) missed thus increasing the production costs.

CONCLUSIONS

In approaching an analysis of the contracting and construction process for apartments in a free market system, from the standpoint of the construction company building the apartments, the following conclusions may be made:

- Because of the complexity of the approach to the process of contracting and constructing apartments for the free market, especially in the segments which deal with the securing of the site and the outfitting of the building site, the difficulties of insuring work continuity of construction capacities are evident;
- Construction companies have too little influence on the planning of the programs of apartment construction, including the sites which are planned for construction;
- The contractor has no influence at all on the approach to the outfitting of the site, and the process itself has practically undefined deadlines;
- The contractor - construction company is completely outside the influence of the actualization of the infrastructure on the site it is building;
- The securing of credits (loans) for residential market construction are evidently significant difficulties, along

with very high rates of interest.

The solving of the mentioned problems would achieve multi-faceted effects during the constructing and contracting of apartments for the free market: the residential construction would be hastened, the useful capacity of the construction company would be increased, work productivity would be increased, construction deadlines would be shortened, building costs would go down, and thus the selling price of apartments would also be reduced.

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International Council for Building Research Studies and Documentation

WORKING COMMISSION W92

**PROCUREMENT
SYSTEMS**

**SYMPOSIUM
10. - 13. SEPTEMBER 1990
ZAGREB
YUGOSLAVIA**

**"THE STANDARD PROCUREMENT
PROCEDURE FOR BUILDING
WORKS IN THE UK AND THE
RELATIONSHIP BETWEEN BILLS OF
QUANTITIES AND THE FORM OF
CONTRACT"**

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GRAĐEVINSKI INSTITUT

THE STANDARD PROCUREMENT PROCEDURE FOR BUILDING WORKS IN THE UNITED KINGDOM AND THE RELATIONSHIP BETWEEN BILLS OF QUANTITIES AND THE FORM OF CONTRACT

THE PROCESS OF OBTAINING TENDERS

Bills of Quantities are prepared by an independent consultant (i.e. The Quantitor Surveyor) and competing contractors price these out in detail and return a tender figure only. The length of time for tendering, number of contractors invited and other procedural details are set out in the document: "Code of Procedure for Single Stage Selective Tendering".

THE STANDARD PROCEDURE FOR PREPARATION OF BILLS OF QUANTITIES

Bills of Quantities are prepared in accordance with the Standard Method of Measurement - Seventh Edition (S.M.M.7). This document is the latest revision of the measurement "bible" and is supposed to be mandatory as from 1988. However, not all Bills of Quantities are measured in accordance with this document. Some clients in their wisdom prefer to use S.M.M.6 or even S.M.M.5 or a particularly qualified version of any one. The process of preparing Bills of Quantities has changed over the last 100 years from being ordered and paid for by each separate contractor to the present position when the client directly contracts with his own Quantity Surveyor who produces a common document for all tenderers. Contractors are guaranteed of the accuracy of this document. They are all tendering on the same basis and only subsequent changes or errors are automatically corrected during the progress of the works. This factor transfers a significant risk from the contractor to the client. Building work over the last 100 years has changed considerably in many respects and S.M.M.7 has attempted to recognise this within its framework.

In my opinion, S.M.M.6 was a disaster in many respects and although S.M.M.7 has rectified some of the previous misguided academic ideas, there are still some serious flaws. One of the big problems in the United Kingdom is the tendering implications for specialist work such as Mechanical and Engineering Services. Traditionally this specialist work was included as "Design and Build" packages within the main contract with complicated contractual difficulties often encountered. Various ways of dealing with this have been used. "Nomination" would seem to be a dying process. "Naming" is finding favour at the present time. S.M.M.7 has devoted considerable space for rules which enable this specialist work to be measured in detail. However, it is unlikely that any significant changes will occur from the "Design and Build" specialist packages. This is due to a combination of tradition, shortage of time in the UK scenario and not least the fact that most clients will have to be persuaded that it is in their interests financially!

In the UK the custom is usually to start work on site at the earliest possible opportunity. It would seem that insufficient advance planning is generally made. This factor causes

some work to be tendered for which is not completely designed. S.M.M.7 makes a serious effort to place this risk on the client instead of the contractor. In my opinion, the rules are very woolly in this respect and will in practice be shown to be seriously flawed. I will give practical examples of possible loopholes. S.M.M.7 is a document which nominally has been drawn up with the agreement of all sides of the UK Building Industry. Representatives of the Contractor's organisations were involved but there is ample evidence that in practice most experienced estimators are very unhappy with the format of the Bills of Quantities. To my mind the most important object of a Bill of Quantities is to enable tenders to be prepared and submitted to the client. This vital fact has not been thought out properly and too much in the way of academic cosmetics has been included. Nevertheless S.M.M.7 is vastly superior to its predecessor and might reverse a trend away from Bills of Quantities especially with some early adjustments.

THE RELATIONSHIP WITH STANDARD FORMS OF BUILDING CONTRACT

In the UK the two main forms of building contract are known as "J.C.T. 80" and "I.F.C. 84". These terms stand for Joint Contracts Tribunal 1980 contract and the Intermediate Form of Contract - 1984 respectively. Both these contracts expressly state that Bills of Quantities shall be in accordance with S.M.M.7 and any departures from this Method must be detailed specifically. These contracts firmly tie up the relationship with S.M.M.7 and in particular the machinery for identifying any changes (variations) made from the actual tender. There are stated rules for the valuation and agreement of such variations. Variations not only include additional, varied or omitted work but also changes in site conditions or sequence or disturbance of progress caused by the client or his advisors.

OTHER TENDERING METHODS FOR BUILDING IN THE UK

In recent years there has been a marked decline in the aforementioned procedures. "Design and Build Contracting" is rapidly gaining popularity but there would seem to be a resistance noted in recent times to "Management Contracting".

It is also possible for a client to seek tenders by advertising to all and sundry but this has been more or less eclipsed by having a selected list of contractors. Occasionally clients will negotiate directly with a particular contractor but this is the exception rather than the rule. A formal Bill of Quantities might well be used in the latter case.

Ten years or so ago the British Property Federation (B.P.F.) indicated dissatisfaction with the accepted methods of procurement of building contracts. They introduced the new A.C.A. Contract (Association of Consultant Architects) which placed considerably

more risk on the builders. Initially, with a recession in the industry, some builders accepted it. However, in recent years there has been effective resistance to the use of this contract. Bills of Quantities are not normally envisaged.

Civil Engineering work has a different Method of Measurement (C.E.S.M.M.) and a different form of Standard Contract.

THE COMMITTEE FOR CO-ORDINATED PROJECT INFORMATION

The C.P.I. initiative was launched in 1988 in the UK with a view to standardising and integrating the building design process. It attempted to co-ordinate the activities of the design team and improve pre-contract planning. Drawings, Specifications and Bills of Quantities were carefully considered and recommendations were made. After two years the results have been very disappointing but I am hopeful that progress will be stepped up and the UK Building Industry will benefit considerably in the not too distant future.

A.A.B. Wood.
July 1990



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**WORKING COMMISSION W92
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**AN OVERVIEW OF PROCUREMENT
PROCEDURES IN PROJECTS
FINANCED BY THE WORLD BANK"**

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DEPARTMENT**



GRAĐEVINSKI INSTITUT

AN OVERVIEW OF PROCUREMENT PROCEDURES IN PROJECTS FINANCED BY THE WORLD BANK

Historical Perspective

The International Bank for Reconstruction and Development (IBRD, the World Bank) was established in 1945, following the Bretton Woods Conference, in response to the need for reconstruction after the Second World War, and also to assist developing countries to achieve growth and prosperity. Assistance to developing countries is now, as it has been for many years, the main focus of its operations. Currently 152 developed and developing countries are members of the World Bank, and several applications are being processed, for other countries to join, including countries in Eastern Europe.

The other institutions in the World Bank Group were established at later dates: in 1956, the International Finance Corporation (IFC), dedicated to the promotion of growth in developing countries through support of the private sector; in 1960, the International Development Association (IDA) which provides assistance in concessional terms to the poorest countries; and in 1988, the Multilateral Investment Guarantee Agency (MIGA), whose purpose is to encourage foreign investment in developing countries by providing guarantees to foreign investors against loss caused by noncommercial risk.

This paper centres on the procurement procedures of the World Bank, which also apply in full to IDA-financed projects. IBRD and IDA operations are administered by the same World Bank staff, and the projects they finance must meet the same criteria in order to qualify for a loan.^{1/} The paper does not deal with the operations of IFC and MIGA, which do not finance the procurement of goods, works and services directly. The IFC assists in the formation of industries and businesses in developing countries; any resulting procurement is carried out following commercial practices. MIGA, by definition, provides cover to investors, who are responsible for their own procurement.

Volume of World Bank-Financed Procurement

Since it started operations, the Bank has provided more than \$200 billion ^{2/} in financing for some 5,000 projects. In fiscal year 1989 (July 1, 1988 to June 30, 1989) alone, lending totalled \$21.4 billion for 225 new operations. Since the World Bank finances only part of the total cost of projects (usually all or part of the foreign currency content of projects, the balance being financed either directly by the borrowers or cofinanced by other international agencies and commercial banks), the total volume of procurement which will result from these operations should exceed \$55 billion, as the projects they finance are implemented in the coming years.

The above adds to the load of about 2,000 projects under execution, arising from loans committed during the previous years. These result in the Bank reviewing and funding about 30,000 individual contracts every year. Disbursements for the procurement of goods, equipment and works amount to about 92% of all disbursements, of which, about one-third for works and the

^{1/} Further reference to the World Bank in this paper includes IDA.

^{2/} In this paper, one billion equals 1,000 million.

balance for goods and equipment. Services--largely consultancies, engineering, technical assistance--account for the remaining 8%.

Table 1 shows the regional distribution of lending in fiscal year 1989; Table 2, the distribution by sectors. For every dollar that the World Bank lends, the total procurement generated in each sector varies. In fiscal year 1989, this "multiplying factor" ranged from about five dollars for the energy and power sector, down to almost par, for non-project lending, which usually relates to the financing of imports only. Table 2 also shows total project values, lending amounts, and the ratios between total value/lending, by sectors. It must be stressed that these values and ratios are indicative of the lending operations of fiscal year 1989 and should not be extrapolated. Although the relative order of lending by regions and sectors has remained reasonably stable over the last decade, absolute values and the total value/lending ratios will tend to change from year to year, in response to priorities for lending, type of projects, and their content.

In addition to traditional agricultural projects and large infrastructure projects to construct dams, railways, ports, power stations, and so forth, the World Bank increasingly is lending for projects in other sectors such as education, population, health and nutrition, urban and rural development, industry and telecommunications. Many infrastructure projects support rehabilitation and maintenance of existing assets rather than new construction. Overall, Bank-supported projects range from the complex and equipment intensive to those in which training skills and specific knowledge are the principal resources transferred.

The Project Cycle

Borrowers are responsible for the preparation of projects for appraisal by the World Bank, and later for all procurement and implementation. However, the Bank is deeply involved at all stages of the project cycle, usually starting during the regular dialogue which the World Bank holds with each borrower, on matters of macroeconomic policy, strategies for development, and priorities for investment, or during the execution of a prior project in the same sector.

The first step in the cycle is the identification of the project, which may arise from the above economic dialogue between the borrower and the World Bank, or as a "follow-up" of another project in the same sector; from the work of other United Nations Agencies; from proposals from private sponsors; or from specific World Bank identification missions. However, it is essential that the World Bank and the borrower agree that a project is a priority investment, before it can be incorporated in the Bank's lending pipeline.

After the World Bank and the borrower have agreed on the priority and objectives of a project, the borrower starts the preparation phase. This requires the elaboration of reports on the technical, financial, economic, and institutional feasibility of the project, including an in-depth discussion of the alternative means to achieve the required goal. The social and environmental impact of the project must also be carefully studied, and the solutions for any problems which the project may cause discussed in depth.

Although the identification and preparation stages are the responsibility of the borrower, the World Bank may assist by financing any technical assistance necessary for the feasibility studies and design work, for instance, as components of a previous project, or as a special project preparation

facility, which entails advancing funds to the borrower to pay for such technical assistance. It is usually desirable that the preparation of procurement documents start at this stage, so that fully agreed bidding documents may be available either at a more advanced stage of project generation, or at the time of loan approval, to expedite the implementation process. World Bank staff keep a watching brief throughout the preparation period, following the development of the proposals, providing comments and guidance where necessary.

The next stage is the appraisal of the project, which is entirely the World Bank's responsibility. Bank staff prepare an appraisal report, based on a thorough analysis of the preparatory work carried out by the borrower and its consultants. It includes the staff's evaluation of the procurement process and the capability of the borrower to carry it out expeditiously, to meet the project timetable. Where necessary, it recommends actions to be taken to improve the procurement capability of the borrower--for example, through financing technical assistance to strengthen the borrower's own procurement establishment, or the engagement of procurement agents, who can carry out the procurement on behalf of the borrower.

The Appraisal Report is the basis for the next step, that of negotiations with the borrower, at which the various legal documents that will formalize the loan are agreed. These documents set out, inter alia, the procurement arrangements that will be followed in the implementation of the project. The agreed documents are then submitted to the World Bank's Executive Directors for their approval.

It is important to note that the World Bank's Procurement Guidelines,^{3/} as well as the Guidelines for the Use of Consultants, are incorporated (by reference) in the Loan Agreements, and therefore become binding to both parties, World Bank and borrower.

After approval of the loan, funds are available to implement the project--to pay for the goods, works and services listed in the Loan Agreement. The World Bank encourages borrowers to start the procurement process as early as possible in the project cycle, to assist in expediting the implementation phase. In particular, the preparation and clearance with the Bank of bidding documents can be a protracted process (especially if the borrower has little experience with Bank-financed procurement), and should be started at the earliest possible opportunity, at the identification or preparation stage.

Before the loan is approved, borrowers may take the procurement process up to the preparation of bidding documents; or they may take it a step further, calling for bids and evaluating them, but stopping short of award of contracts (Advanced Procurement Action). In some cases, borrowers may take the process all the way to the award of contract--but this implies a risk both to borrower and contractor or supplier, since the funds for the project would not have been confirmed. Usually, this latter procedure is limited to access roads or other preparatory work of a relatively minor import.

Responsibility for implementation of the project and, in particular, the procurement process and contract management rests with the borrower. The World Bank is not a party to any contract, but it does require that procurement be carried out in accordance with the Loan Agreement and the Bank's Procurement Guidelines. World Bank staff do not take part in any of

^{3/} Guidelines for Procurement under IBRD Loans and IDA Credits, May, 1985.

the procurement procedures, but carefully supervise that procurement is carried out following Bank requirements, as a fair and impartial process.

The implementation phase is followed by an evaluation of the project, carried out by World Bank staff on the basis of information supplied by the borrower, leading to a Project Completion Report. The cycle may be closed by a follow-up project, which is frequently the case in practically all sectors.

Principles of World Bank-Financed Procurement

The principles of procurement in Bank-financed operations stem from its Articles of Agreement (Constitution), which stipulate that the World Bank lend for specific projects, except in special circumstances, and ensure that the proceeds of a loan be used only for its specified purpose, with due attention to economy and efficiency. The principles also stem from the nature of the Bank, as a cooperative international institution charged with fostering fair and equitable trade among its members, and as a development institution.

Procurement is an important aspect of the Bank's operations. It is a critical element of project implementation, and unless it is carried out efficiently and promptly, the full benefits of the project cannot be realized: World Bank loans are normally disbursed as expenditures are incurred. Also, the amounts involved in Bank-financed procurement are very large, and competition is keen among contractors and suppliers from member countries. The procurement process is therefore very sensitive and, hence, the impartial administration of procurement among all eligible bidders is essential to maintain the Bank's reputation as an impartial administrator as well as its ability to raise financial resources from its member countries and in the capital markets.

The Bank's Procurement Guidelines, approved by its Board, stem from the above principles, which are summed up in the following three considerations:

- (a) The need for economy and efficiency in the execution of the project, including the procurement of the goods and works involved. This means making sure that the borrower gets the best value for its money.
- (b) The Bank's interest, as a cooperative international institution, in giving all eligible bidders from developed and developing countries an opportunity to compete in providing the goods and works financed by the World Bank. Eligible bidders are those from member countries and Switzerland and Taiwan, China.
- (c) The Bank's concern, as a development institution, in encouraging the growth of local contractors and manufacturers in the borrowing countries. One way in which this support is made effective is through accepting the application of a preference factor for domestic manufacturers (15%, applicable in all borrowing countries) and contractors (7.5%, applicable only in countries with an annual per capita income of less than \$545) in the evaluation of international competitive bids. These preferences are an effort to reconcile the World Bank's interest in the development of local industry, and fostering its participation in the implementation of projects,

with considerations of efficiency and fairness in international trade.

Methods of Procurement

The method of procurement which best satisfies the above considerations is International Competitive Bidding (ICB), which is applied in Bank-financed procurement as a rule. Other methods are acceptable as exceptions to ICB, when it can be demonstrated that the latter is not practicable or will not result in efficient and economic procurement.

ICB brings into play the forces of the international market, and it has been demonstrated that it results in considerable economies in procurement. Also, access to international sources of supply and contracting means that often new or better technologies can be incorporated in a project as a result of the procurement process. It also affords equitable access to all eligible bidders and, through the application of margins of preference, may assist in the development of domestic industries. In addition, ICB fosters the entry of other developing country contractors and manufacturers into the arena of international trade, and reduces the opportunities for corruption and internal price-rigging.

Essential elements of ICB in Bank-financed procurement are:

- * International advertising, following the Bank's Guidelines, affording all eligible bidders reasonable facilities to participate (for example, a reasonable response time, from the date of the advertisements).
- * Formal bidding documents which are fair, nonrestrictive, clear and comprehensive. The World Bank must review and approve the documents, and considerable time and effort are applied by Bank staff to this task. To assist borrowers in the preparation of bidding documents, and simplify and expedite the task of review and approval, the Bank publishes "Sample Bidding Documents". ^{4/} These are documents based on proven international practice which satisfy the requirements of Bank-financed procurement, while providing a sound base for business.
- * Reducing the risk exposure of bidders as much as possible--to obtain from them their best possible price. For instance, the currency provisions of the bidding documents should allow for bidding and payments in "hard currency", where necessary to cover foreign costs; and large contracts, to be carried out over long periods, should include price adjustment provisions, to avoid inflationary risks, which the bidders would have to handle through speculative assessments of future costs. These would tend to inflate the bid prices.
- * The bidding documents should clearly specify the criteria to be used in bid evaluation.

^{4/} At present, three such guides are available: Sample Bidding Documents for the Procurement of Goods (March, 1986); Works (September 1985, currently being revised) and Commodities (January, 1988).

- * Foreign firms should not be required to associate with domestic firms, nor to employ local personnel or use local materials or services.
- * Bid documents should be prepared in any of the three languages accepted by the World Bank for ICB--English, French or Spanish.
- * Bids should be opened in public, in the presence of those bidders who wish to attend, and the names of the bidders and the amounts of their bids should be read aloud and recorded at the time of opening.
- * The contract should be awarded, within the period of validity of bids, to the bidder whose bid has been determined to be the lowest evaluated responsive bid and who meets the appropriate standards of capability and financial resources.

The evaluation of bids for goods may follow one of two procedures: for smaller-scale procurement, a "merit points" system of evaluation is usually recommended whereby points are assigned to the bid price (which should be the dominant factor, usually between 60-90%); and to other factors such as the price of a common list of spare parts, technical features, service and spare parts availability, and standardization.

For the procurement of larger "goods"--such as a fleet of buses, or a thermal power station package, the Bank recommends the use of the "life-cycle" method of evaluation, in which the projected ownership, operating and maintenance costs during the life of the equipment are added to the monetary value of performance and productivity of the equipment, and other quantifiable factors relevant to the equipment in question.

The criterion for the award of contracts for civil works is usually price alone--provided the bid is responsive and the contractor is qualified to do the work. In large civil works contracts, and in some contracts for industrial or power plant installations, bidding is usually preceded by a prequalification of bidders, in which case, price alone is the criterion, provided there are no deviations, and the bid responds to the specifications and other elements of the bidding documents.

Other Methods of Procurement

Limited International Bidding (LIB) is used in cases where there is a known (and well-defined) number of contractors or manufacturers who will be able to provide the particular asset, usually process plant (e.g., fertilizers, petrochemicals, agro-industry), or where the procurement is relatively small, but international competition is still desirable, albeit on a limited scale. The only difference with ICB is that advertising is not required, since bidders are invited directly.

Local Competitive Bidding is applied when it can be demonstrated that international contractors or suppliers will not be interested in bidding for the particular goods or works. A typical example is the construction of small rural access roads or small primary schools in remote areas of a developing country. The local rules must be acceptable to the World Bank, in terms of their fairness and compliance with the Bank's procurement principles.

However, there are considerable differences with ICB--for instance, advertising can be local only; the local language and currency may be used, and so on. One point that the Bank always stresses is that foreign contractors wishing to bid should not be prevented from doing so.

International and Local Shopping. This usually applies to small purchases, or to purchases which must be made expeditiously to overcome a situation of urgency (e.g., reconstruction after an earthquake or hurricane). It consists in requesting written quotations from no less than three local or foreign suppliers, to ensure competitive prices.

Direct Contracting. In cases where competitive approaches are not practicable, the Bank can accept direct contracting from a specific source. There are few instances where this can be applied, including the purchase of proprietary spare parts for equipment already owned by the borrower; extension (by a relatively minor amount) of an existing contract; standardization, and in exceptional cases, where bidding and rebidding have failed to produce a reasonably responsive proposal.

Force Account, or direct labor, i.e., work carried out by the borrower's own forces, is acceptable only as an extreme measure, when everything else has failed, or there are circumstances of extreme urgency requiring immediate action through existing teams in the borrower's payroll. However, in this case, the Bank usually finances only the equipment and foreign materials content of the work, and not the labor and other on-shore costs.

Procurement in Loans to Financial Intermediaries. When loans are made to development banks for on-lending to the private sector or to autonomous enterprises of the public sector, the World Bank accepts that the final beneficiaries (typically, industrialists and farmers) carry out procurement in accordance with commercial practices applied in the sector and in the country--provided those practices are acceptable to the Bank. However, if bulking of requirements is possible (for example, where many farmers wish to buy pumpsets or tractors), then the Bank recommends that the borrower should consider the advantages of calling for ICB, to obtain economies of scale in procurement.

Procurement from United Nations Agencies. Some sister agencies of the UN family, such as WHO and UNICEF, may afford the most efficient and economical way of procuring goods, equipment and works, primarily in the fields of education, health, and rural water supply and sanitation. Typical cases are the procurement of pre-packaged inoculation kits prepared by WHO, or teaching aids assembled by UNICEF, or the carrying out of small, localized works in villages where a resident FAO team can actually manage them by employing local labor directly. UN agencies follow their own procurement methods; however, the Bank requires that its own eligibility rule be applied, and that no more than 10% of the goods purchased originate in noneligible countries.

Adjustment Lending

Fast-disbursing operations have been introduced to assist borrowers to overcome shortages of foreign currency, by financing essential imports. These operations are usually linked with economic and institutional reform, and the application of measures to improve the efficiency of the national economy (structural adjustment loans) or the economy of a sector (sector adjustment loans).

Adjustment loans finance imports only; ICB is mandatory for procurements in excess of \$5 million, by both the public and private sectors. However, the rules for advertising are somewhat relaxed, and one internationally traded currency can be specified for all bidders. Below \$5 million, purchases by the public sector may be carried out following its established practices, provided they have been examined and accepted by the Bank; the private sector may apply established commercial practice, wherever possible requesting quotes from eligible suppliers from at least two countries.

Eligibility of Public Sector Enterprises

The World Bank does not place any restriction to the participation of public sector enterprises in bidding for work or supplies outside their own country-provided, of course, that they are qualified to perform the contract. However, certain important criteria must be met by majority public sector-owned enterprises to participate in Bank-financed procurement in their own country, including,

- * the enterprise must be a legal entity distinct from the borrower;
- * it must be reasonably financially and managerially autonomous; and
- * must meet all qualification and bidding criteria.

If the enterprise is minority publicly-owned (i.e., where the public sector owns less than 50% of the shares), they are treated as normal commercial ventures in all respects, and the above eligibility criteria are not applied.

Cofinancing

When other financial agencies cofinance a project with the World Bank, two situations may arise: first, the funds may be pooled, i.e., cofinancing is joint. In this case, the Bank insists that its Procurement Guidelines be applied in full to all procurement.

It is often the case that cofinanciers require that borrowers meet their own procurement requirements, and under these circumstances joint cofinancing is no longer possible. In such cases, parallel cofinancing applies: the procurement is packaged in such a way that each agency finances a separate part of the project (e.g., in a power station, boilers/turbines/generators/substation). The World Bank's concern is then that the procurement of the elements it does not finance be economic, timely, of suitable quality, compatible with the rest of the equipment, and generally meeting economic viability and warranty conditions for the whole project.

The Engagement of Consultants

The selection and appointment of consultants by World Bank borrowers follows a completely different approach. Price is no longer a ruling criterion, but rather, experience and quality of service. Therefore, the above procurement procedures do not apply to the engagement of consultants.

There are many differences with the procurement of goods and works. In the first place, competition is not publicly advertised, and open to all comers: in the case of consultants, the borrower prepares a short list, usually of no more than six firms, including no more than two from any one nationality, and seeking a reasonable regional distribution.

When borrowers do not know consultants in a particular field, they may request that the Bank prepare a short list. The Bank has a special formal procedure for preparing such lists, to ensure transparency and fairness in the selection. For this purpose, and also to verify short lists prepared by borrowers, the World Bank maintains a computerized register of consulting firms called DACON (Data on CONSultants) which currently holds information on over 6,000 firms of all specialties. In the process of preparing a short list, an initial "long list" of all firms showing expertise in a certain discipline is drawn from DACON; the selection process, which is handled by a committee of senior staff, follows from this point.

Second, as stated previously, price is no longer the controlling criterion. Technical merit takes precedence, and usually price is not taken into account (or, if it is, only to a lesser extent--say, contributing no more than 20 points out of 100 in a merit point rating) in the selection of a consultant.

Third, negotiations are not usually acceptable in competitive procurement. By contrast, extensive negotiations--on the terms of reference, extent of services, particulars of the contract form, and so on--are usually the case in the engagement of consultants.

The usual factors used by borrowers in evaluating the proposals presented by consulting firms are the firm's experience in the disciplines necessary for the work in hand; the adequacy of its general approach to the task, and of the proposed work plan; and the experience and general suitability of the personnel that the firm would assign.

As in the case of the procurement of goods and works, the borrower is responsible for the selection and engagement of consultants, and for supervising their work. However, Bank staff usually follow closely the work of consultants, since the results that they obtain will affect on-going or future projects. If the consultants are engaged for a feasibility study, for example, the results of the study will influence the World Bank's appraisal of the project; if engaged in the supervision of construction, the ultimate results of the project will depend on the quality of field work displayed by the consultant's staff.

To assist borrowers in the process of engaging consultants, the Bank has published a "Sample Form of Contract for Consultants' Services" (March 1989).

EEHenriod
July 26, 1990

Table 1

World Bank Lending by Region
(In millions of US dollars)

| Region | Amount | Percentage of Total Lending |
|---|--------|--------------------------------|
| ----- | ----- | ----- |
| Africa | 3,925 | 18 |
| Asia | 7,833 | 37 |
| Europe, Middle East and North Africa (EMENA) | 3,768 | 18 |
| Latin America and the Caribbean | 5,842 | 27 |
| Total Lending | 21,368 | |

Source: The World Bank - Annual Report 1989

Table 2

World Bank Lending by Sector
(In millions of US dollars)

| Sector ----- | Amount ----- | Percentage of Total Lending ----- | Total Value of Projects ----- | Total Value/ Lending Ratio ----- |
|---------------------------------|-----------------|---|-------------------------------------|--|
| Telecomms. | 161 | 1 | 736 | 4.6 |
| Pop., Health and Nutrition | 624 | 3 | 1,245 | 2.0 |
| Water Supply & Sewerage | 791 | 4 | 2,069 | 2.6 |
| Education | 891 | 4 | 1,612 | 1.8 |
| Urban Develpt. | 1,188 | 6 | 3,718 | 3.1 |
| Transportation | 1,831 | 9 | 5,207 | 2.8 |
| Develpt. Finance Cos. | 2,367 | 11 | 3,490 | 1.5 |
| Industry | 2,567 | 12 | 6,100 | 2.8 |
| Agriculture & Rural Develpt. | 3,490 | 16 | 8,816 | 2.5 |
| Nonproject & Tech. Asstce. | 3,594 | 17 | 4,354 | 1.2 |
| Energy & Power | 3,864 | 18 | 19,025 | 4.9 |
| Totals | 21,368 | | 56,372 | |

Source: The World Bank - Annual Report 1989

Annex 1

List of World Bank Publications
Relevant to Procurement and
the Engagement of Consultants

- GUIDELINES: Procurement under IBRD Loans and IDA Credits. May, 1985.
- GUIDELINES for the Use of Consultants by World Bank Borrowers and by the World Bank as Executing Agency. August, 1981.
- Sample Bidding Documents. Procurement of Goods. March, 1986. (Jointly with the Interamerican Development Bank).
- Sample Bidding Documents. Procurement of Works. September, 1985. (Jointly with the Interamerican Development Bank).
- Sample Bidding Documents. Procurement of Commodities (Fertilizers and Fertilizer Raw Materials). January, 1988.
- Sample Form of Contract for Consultants' Services. March, 1989.
- Guide to International Business Opportunities. 1989.
- The Project Cycle. By Warren C. Baum. Second Printing, October, 1983
- The Construction Industry. Issues and Strategies in Developing Countries. February, 1984.

The above are available from the Publications Department, The World Bank, 1818 H Street, N.W., Washington, D.C., 20433, U.S.A.



International Council for Building Research Studies and Documentation

**WORKING COMMISSION W92
PROCUREMENT
SYSTEMS**

**SYMPOSIUM
10. - 13. SEPTEMBER 1990
ZAGREB
YUGOSLAVIA**

**HARMONIZATION OF
CONSTRUCTION
LAWS WITHIN EEC**

**MR. CLAUDE MATHURIN:
QUALITE CONSTRUCTION**



GRAĐEVINSKI INSTITUT

NOTE SUR L'HARMONISATION DU DROIT DE LA CONSTRUCTION DANS L'ESPACE COMMUNAUTAIRE

1 - LE CONTEXTE GÉNÉRAL

Les institutions communautaires sont engagées dans un processus de réalisation de l'espace sans frontières depuis juin 1985, date de la publication du livre blanc dont l'objectif est l'achèvement du marché intérieur. Ce programme sert de support à l'élaboration de dispositions conformes à l'Acte unique et notamment à l'article 8A du Traité.

La Commission des communautés européennes poursuit avec détermination la mise en œuvre de ce programme, si bien que toutes les propositions annoncées en 1985 ont été transmises au Conseil, parfois complétées par des propositions additionnelles.

Lors de la réunion tenue, en décembre 1989 à Strasbourg, le Conseil européen s'est attaché au respect des priorités politiques au cœur de ce programme. Il a particulièrement insisté sur les thèmes de l'espace financier, de l'ouverture des marchés publics, de la politique des transports et de la libre circulation des personnes. Il a demandé que soient prises les décisions qui rendront irréversible le processus d'abolition complète des frontières fiscales.

La réalisation progressive du livre blanc ne peut être dissociée de la réalisation des cinq autres objectifs de l'Acte unique, à savoir cohésion économique et sociale, politique sociale, environnement, politique de recherche, capacité monétaire.

2 - LES ACTIONS EN COURS

S'agissant du secteur de la construction, qui couvre à la fois le génie civil et le bâtiment, les principales dispositions élaborées jusqu'à présent sont la directive 89/106/CEE relative au rapprochement des dispositions législatives, réglementaires et administratives des Etats membres concernant les produits de construction et la directive 71/305/CEE portant coordination des procédures de passation des marchés publics de travaux modifiée par la directive 89/440/CEE.

D'autres textes communautaires intéressant plus ou moins la construction portent sur les architectes (diplômes, droit d'établissement, libre exercice), sur les groupements européens d'intérêt économique, sur les règles techniques de conception, de dimensionnement et de calcul des ouvrages (eurocodes).

Est actuellement en cours de mise au point un projet de directive portant coordination des procédures de passation des marchés publics de services, qui n'est pas spécifique de la construction.

3 - LA COMPARAISON DES 12 SYSTÈMES

La Commission a estimé nécessaire de procéder à l'étude comparative des différents systèmes nationaux régissant le secteur de la construction dans les 12 Etats membres. Cette analyse, réalisée en 1987-1988, postérieurement à la parution du Livre blanc, est disponible en français, anglais et italien. Elle présente essentiellement les dispositions nationales relatives aux lois et règlements sur la construction, au contrôle de la construction, à la passation des marchés publics et privés de travaux et d'études, aux opérations de réception des ouvrages, à la responsabilité des constructeurs, aux systèmes de garantie des maîtres d'ouvrage et des acheteurs, aux mécanismes d'assurance dommages et d'assurance de responsabilité.

4 - L'HARMONISATION ENVISAGÉE

La Commission a confié à l'auteur de cette étude comparative une deuxième mission portant sur l'éventuelle harmonisation des systèmes nationaux, notamment en matière de responsabilité, de garantie et d'assurance, et dans la ligne des dispositions déjà prises au niveau communautaire sur les marchés de travaux et sur les produits de construction.

Réalisée en 1988-1989, cette étude est actuellement disponible en français, allemand et anglais. Elle contient 15 propositions élaborées à partir de 52 thèmes identifiés dans l'ordre chronologique de l'acte de construire.

Il est dans l'intention des services de la Commission de soumettre dans le courant du 2ème semestre de l'année en cours aux représentants des 12 Etats membres la plupart des propositions extraites du rapport paru en 1989 afin d'engager une éventuelle action d'harmonisation du droit de la construction au niveau communautaire.

Souhaitée par le Parlement européen, une telle action viendrait compléter le dispositif sur les marchés publics et sur les produits de construction, dans la ligne du livre blanc qui prévoit déjà des mesures communautaires sur la réglementation de la construction, sur la durabilité des bâtiments, ainsi que sur la fiabilité des ouvrages.

5 - L'OBJET DE LA PRÉSENTE NOTE

L'objet de la présente communication présentée par l'auteur des deux études citées en 3 et 4 ci-dessus est de résumer le contenu des propositions déjà soumises à la Commission et de recueillir, au moment opportun, les opinions et les observations des membres éminents du groupe de travail CIB W92 sur ces propositions.

Il ne s'agit là évidemment que d'une consultation entre experts : ni l'auteur des rapports, ni bien entendu le groupe W92 n'ont qualité pour engager aussi peu que ce soit les autorités communautaires.

Brièvement résumée, la première étude a mis en évidence l'extrême diversité des lois et des pratiques de la construction dans l'espace communautaire. L'auteur estime qu'aucun pays, n'a le privilège de disposer d'un système parfait. Les incertitudes, les lacunes, les anachronismes abondent. La principale critique, c'est : trop de règles, trop de textes, trop de litiges.

Au vu de ces insuffisances, il est légitime de se poser deux grandes questions :

- celle du fonctionnement du marché communautaire de la construction dans un "environnement" législatif, réglementaire et administratif inadapté,
- celle de la protection de l'acheteur de BTP et spécialement de l'acheteur d'un logement neuf, trop souvent confronté à des "accidents" techniques ou contractuels.

6 - LES DIVERGENCES CONSTATÉES

Elles portent d'abord sur la notion même de réglementation de la construction, sujet qui n'est pas traité ici.

Elles concernent les domaines suivants :

- existence ou absence de contrôle de la construction
- rôle et fonction des différents intervenants dans l'acte de construire,
- stabilité ou foisonnement des lois et règlements de la construction
- avantages et risques d'une décentralisation des textes
- nature et contenu du contrôle des opérations de construction
- rôle et responsabilité des architectes et autres auteurs de projet
- capacité ou effacement des services techniques publics
- encadrement ou laisser faire en matière de compétence des acteurs
- recours massif ou partiel à l'entreprise générale
- doubles juridictions et législations : marchés publics et contrats privés
- sévérité ou non de la responsabilité post construction des entrepreneurs
- nature de la responsabilité de l'auteur du projet,
- charge de la preuve en cas de dommages
- existence ou absence de systèmes efficaces de protection de l'acheteur
- domaine d'application des assurances de responsabilité professionnelle.

7 - LES SIX OBJECTIFS PROPOSÉS

Devant une telle diversité, et fort de la conviction qu'aucun pays n'a réussi à construire un système vraiment satisfaisant, l'auteur suggère à la Commission un ensemble de propositions présenté dans la deuxième étude avec six objectifs à savoir :

- définir au niveau communautaire les principales fonctions des intervenants dans l'acte de construire,
- harmoniser le contrôle de la construction au regard des six exigences essentielles de la directive "produits de construction",
- instituer une responsabilité unifiée et adaptée aux fonctions des différents intervenants,
- créer une garantie minimale de bonne livraison et de bonne tenue des ouvrages,
- généraliser l'emploi de systèmes efficaces de protection de l'acquéreur d'un logement neuf,
- améliorer les rapports contractuels et opérationnels entre les intervenants.

Il va de soi que la recherche d'un consensus politique sur de tels objectifs constitue un préalable à la mise en place éventuelle d'un système communautaire.

D'une manière globale, à quelques exceptions près, il peut être dit qu'environ 4 professionnels sur 5 se prononcent en faveur de ces objectifs et des "esquisses de solution" dont il sera question ci-dessous en 9.

Cela ne signifie nullement que la "majorité qualifiée" de l'article 100 A du traité sera atteinte !

8 - LES 52 THÈMES À ÉTUDIER

Le rapport final contient en son chapitre II la liste des 52 thèmes qui, selon l'auteur, méritent un examen au niveau communautaire.

L'énoncé détaillé présentant ces différents thèmes fait l'objet de l'annexe II, qui ne figure pas dans la version condensée du rapport.

A priori, certains thèmes peuvent intéresser tout particulièrement votre groupe de travail, et notamment les thèmes :

- 10 - qualification des entreprises
- 11 - mission des concepteurs
- 12 - achat et vente
- 13 - cautions et bords
- 14 - paiement des constructeurs
- 15 - guide maîtres d'ouvrage
- 16 - présentation des dossiers d'appel d'offres
- 17 - spécifications
- 18 - organisation des appels d'offres
- 19 - arbitrage permanent
- 20 - réception
- 21 - clauses générales "travaux"
- 21 - clauses générales "études"
- 23 - concours d'architecture
- 24 - marchés - types "travaux"
- 25 - chaîne des responsabilités
- 26 - modèle contrat de construction
- 27 - modèle contrat de vente
- 28 - modèle contrat de leasing
- 29 - contrôle des matériaux
- 30 - lots séparés ou entreprise générale
- 31 - forfait ou prix unitaires
- 39 - modèle de code civil
- 44 - garanties G5/G10/G15
- 50 - sous-traitance

ainsi que les thèmes :

- 0 - langage
- 1 - processus
- 5 - les acteurs
- 6 - maître d'ouvrage
- 7 - auteur du projet
- 8 - entrepreneur

Seules quelques unes des fiches de l'annexe II sont jointes à la présente note.

Il serait évidemment fort intéressant de connaître l'avis du groupe W92 sur cette liste de thèmes dans la perspective d'une harmonisation "nécessaire et suffisante", respectant le principe de "subsidiarité" qui règne sur toute nouvelle initiative communautaire.

9 - LES 15 ÉLÉMENTS PROPOSÉS

Rédigé fin 1989 après avoir recueilli l'avis d'une centaine de représentants des diverses familles du secteur de la construction, le rapport final suggère de composer le futur système communautaire à partir de 15 éléments.

Chaque élément reprend au moins l'un des 52 thèmes précédents.

Le rapport présente également une trame montrant comment les 52 thèmes et les 15 éléments pourraient être inclus dans 3 directives et 3 recommandations, cette "architecture" pouvant bien entendu être revue selon le degré de contrainte qu'il sera finalement décidé de réserver aux dispositions retenues.

Certains penchent en faveur d'une seule directive et d'une seule recommandation, cette dernière ayant le caractère d'un "guide pratique".

Quoiqu'il en soit, les 15 éléments tels qu'ils figurent dans le rapport final sont les suivants :

E.O - Langage - Traduction dans les 9 langues communautaires des principaux concepts (une cinquantaine) du droit de la construction.

E1. Processus de construction - Définition détaillée des cinq ou six processus de construction d'usage courant dans l'espace communautaire.

E2. Fonctions principales - Définition des quatre fonctions principales exercées dans tout acte de construire, et en particulier, celle de l'auteur du projet.

E3. Rôle du maître d'ouvrage - Définition du rôle et des obligations de tout maître d'ouvrage, public ou privé.

E4. Contrôle extérieur - Définition du contrôle technique de la construction et de la certification du respect des six exigences essentielles.

E5. Missions des concepteurs - Réglementation communautaire des missions et des modes de rémunération des architectes et des ingénieurs.

E6. Arbitrage permanent - Définition et institution d'un système communautaire de conciliation et d'arbitrage permanent.

E7. Réception communautaire - Définition et institution de la réception communautaire dans le cadre d'un contrat de construction ou de vente.

E8. Responsabilité spécifique - Instauration d'une responsabilité décennale unifiée des constructeurs, stricte pour certains d'entre eux pendant cinq ans. Inspection technique quinquennale.

E9. Garantie quinquennale - Instauration d'une garantie quinquennale minimale de bonne livraison et de bonne tenue attachée à tout ouvrage neuf ou réhabilité (G5). Normalisation de garanties plus longues (G10, G15, G20).

E10. Assurance logement - Mise en place prioritaire des garanties G5 et autres attachées à tout logement neuf, ou réhabilité construit, vendu ou loué.

E11. Assurance projet - Harmonisation des différents types d'assurance projet, couvrant à la fois les dommages décennaux de l'ouvrage et la responsabilité spécifique des constructeurs.

E12. Assurance professionnelle - Développement de l'assurance de responsabilité professionnelle des architectes et des ingénieurs dans l'espace communautaire.

E13. Compétence des acteurs - Définition des critères de qualification exigibles des constructeurs, et notamment des entrepreneurs et des promoteurs.

E14. Sous-traitance - Mise en place d'un ensemble de dispositions applicables aux sous-traitants et aux fournisseurs agréés tout au long de l'acte de construire et pendant la période de responsabilité spécifique.

D'autres dispositions sont également suggérées, à propos notamment de la visite quinquennale des ouvrages et de la licence d'exercice.

Tout ce qui vient d'être exposé doit être considéré comme un ensemble de pistes permettant de bâtir au niveau communautaire un programme d'action à partir de 15 esquisses de solution.

Cette présentation, qui résulte d'une comparaison des systèmes nationaux, se veut réaliste. Elle procède d'une certaine logique et possède une certaine cohérence globale.

10 - LA FORME DU SYSTÈME FUTUR

Sous quelle forme pourrait être présenté l'éventuel système communautaire harmonisé ?

Le rapport suggère trois directives et trois recommandations. Il pourrait être envisagé de procéder à des regroupements et même d'aboutir à une seule directive et à une seule recommandation.

La plus grande attention doit être accordée à la présentation matérielle des documents constitutifs du système.

A cet égard, les réglementations britanniques et allemandes d'une part, les modèles néerlandais d'autre part, peuvent servir de référence.

La directive D1 porterait sur l'acte de construire : processus de construction, certification finale, principales fonctions, rôle du maître d'ouvrage, notions de contrôle extérieur, ainsi éventuellement que achat et vente de logement, paiement des constructeurs, qualité et permis de construire.

La directive D2 (qui pourrait être remplacée par un règlement d'application immédiate) porterait sur les prestations des concepteurs : missions, modes de rémunération, rédaction des contrats, notions de mission totale, de coût d'objectif, qualité d'objectif etc... Notions de motivation et d'incitation, de niveau minimum d'honoraires, voire de domaine réservé.

La directive D3 porterait sur la responsabilité spécifique des constructeurs, la garantie quinquennale attachée à tout ouvrage neuf ainsi qu'aux systèmes d'assurance dommages ou autres, sur la protection de l'acheteur d'un logement neuf, sur l'agrément des sous-traitants et des fournisseurs, sur la réception en cas de construction ou en cas de vente etc...

Lui seraient annexés différents modèles, et notamment un "modèle de code civil de la construction", ainsi que des modèles de contrats de construction, de vente ou de location d'un logement neuf ou réhabilité.

La recommandation R1 serait un guide pratique pour les maîtres d'ouvrage limité ou non à la maîtrise d'ouvrage publique.

Y seraient traitées l'ensemble des questions retenues au niveau communautaire tout au long du processus opérationnel, et notamment le déroulement pratique des appels d'offres de travaux, d'études, d'études et de travaux sans oublier les concours d'architecture.

Lui seraient annexés les clauses contractuelles générales des marchés de travaux, les marchés-types ad hoc (différents processus de construction, ouvrages simples, moyens ou complexes etc...) ainsi que des modèles de bords.

La recommandation R2 serait le guide pratique pour les arbitres, destiné à couvrir à la fois la période de construction (notion italienne du "collaudatore"), la réception (intervention d'un tiers) et la période de responsabilité décennale.

L'objectif serait double : contribuer à la stabilité du droit de la construction dans l'espace communautaire d'une part, éviter de régler devant les tribunaux une multitude d'affaires simples d'autre part.

Un guide de cette nature devrait un caractère concret, notamment pour la définition des "dommages décennaux".

La recommandation R3 serait le guide pratique pour les auteurs de projet : présentation des estimations aux diverses étapes des études, harmonisation de la partie technique des dossiers d'appels d'offres etc...

Il est absolument nécessaire que les praticiens eux-mêmes, ceux qui font des études, concluent des contrats, exécutent des travaux, achètent des ouvrages se prononcent sur ce qui précède.

A priori, il semble réaliste de prévoir 4 années pour la mise en place du système :

- deux années (1991-1992) pour l'élaboration et l'approbation des textes de base,
- deux années (1993-1994) pour la rédaction et la diffusion des documents pratiques : modèles, guides, etc...

Telles sont, Mesdames et Messieurs, les informations qui peuvent vous être données aujourd'hui.



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FIDIC CONTRACT DOCUMENTS

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FIDIC CONTRACT DOCUMENTS

1) FOREWORD

The development of business activities in construction and erection of complex projects has emphasized already in 19th century, and particularly during the 20th century, the most important role of consulting engineers (French: ingénieurs conseils, German: Beratender Ingenieure) who started to act as consultants to owner (Client/Employer) in solution of different technical and other problems in construction of particular object (plant). Sometimes, due to their particular knowledge, like: designing, technology procedures, licensing etc., they were also acting in performance of some services usually given by Contractor.

It is a real fact that in last decades the contract documents on both national and international level have been created and developed not any more by state or government regulations but by professional associations, great business corporations and international financing institutions.

In the field of civil engineering construction, electrical and mechanical works as well as of consulting engineers' services the most important role in creation of such documents has been played by International association of consulting engineers - FIDIC, which is the acronym of French name for this association: Fédération Internationale des ingénieurs conseils, with its headquarters in Lausanne (Switzerland). The business participants accepted those documents through their practice and in this way confirmed their validity as rules for their behaviour. The experience in practicing of those rules has led to their modifications, as well as creation of new rules, which took place in later stages of their practice.

2) GENERAL CONDITIONS

Different business activities, like consulting engineering services, civil engineering works and electrical or mechanical works, create very often similar contractual relations between contractual parties. For that reason it appeared as very convenient and practical to start create the pattern frameworks, known as general conditions or model forms for agreement, for each of mentioned activities.

Usually, general conditions contain, mainly, clauses of general meaning, applicable to most of the contracts of one kind of activity, but do not contain special clauses relating to particular contractual relationship. There are, however, general conditions containing both general and special clauses, as it will be shown later.

Although the contractual parties can always set their relationship by particular contractual document, there are several reasons that give advantage to use of general conditions:

- general conditions have been set up by different professional associations after long considerations and studies having in mind requirements and needs of practice,
- once set up, general conditions are not definite and their creators follow their application and modify them from time to time accordingly experience and practical needs,
- in creation of general conditions participate not only representatives of engineers' associations, but also representatives of other parties, what assures protection of interest of all parties,
- general conditions contain answers to some very delicate questions, like liability and restriction of liability, what usually presents difficulties during negotiations so that parties sometimes omit to insert them in the contract in a proper way,
- possibility of application of a foreign law or legal system in international contracts provokes often uncertainty for at least one party. In such a case general conditions give to the parties rather high degree of certainty.

For all these reasons the application of general conditions has been so common today not only in the field of mentioned, but also of all business activities on both national and international market.

3) FIDIC

FIDIC plays, as mentioned above, very important and most significant role in creation of international contractual documents.

FIDIC was formed in 1913 in Belgium by four European national associations of independent consulting engineers, in order to promote in common the professional interest of member associations and to disseminate information of interest to its members.

FIDIC today numbers about fifty national associations from all over the world. They comply with FIDIC's code on professional status, independence and competence (Art. 3 of FIDIC's Statutes). According to the FIDIC's code:

- consulting engineer "must act in the legitimate interest of his client". He identifies with his client's aims.

- consulting engineer's independence means that his "professional advice, judgement and decision must not be influenced in any way by a connection with another person or organization".
- consulting engineer must have necessary knowledge and experience to enable himself to fulfil his mission.

The membership in FIDIC is restricted to one association per country. It represents an assurance that a consulting engineer subscribes and accepts the Code of ethics on professional status, independence and competence.

The General Assembly of FIDIC has adopted the requirements for the proper conduct of an independent consulting engineer like those concerning:

- taking over work of another consulting engineer for the same client,
- consulting work in other countries,
- personal advertising,
- competitive bidding etc.

Fidic has today four regional groupings of its member associations:

- FIDIC member associations in the Asia and Pacific region,
- FIDIC member associations in the European Community,
- FIDIC group of African member associations,
- FIDIC's Nordic group of member associations.

Each of these groupings meet regularly, at least once per year, to discuss problems of regional interest to the associations and to promote the profession of independent consulting engineer by interchange of informations on consulting activities.

The FIDIC's activities have been developed through Executive Committee and a dozen of other committees, among them five, so called, "Standing Committees":

- 1/ Client/Consultant Relationship Committee,
- 2/ Civil Engineering Contracts Committee,
- 3/ Electrical and Mechanical Contracts Committee,
- 4/ Professional Liability Committee,
- 5/ Arbitrators List review Committee.

The first three of these committees play very important role in the matter of creation, application and modification of FIDIC contract documents. Their terms of reference are:

- To monitor the use of the Client/Consultant model services agreement, respectively FIDIC "Conditions of contract of civil engineering construction" and "Conditions of contract for electrical and mechanical works", as well as "guides" to the use of these conditions.

- To recommend any changes of above mentioned documents that may be considered necessary.
- To monitor the establishment and the use of the other publications of FIDIC related to this matter (e.g. "Tendering procedure" applicable for use on international civil works).
- To assist in the identification of representatives for seminars and study groups in order to foster a common understanding of procedures and practice in the consulting profession.

FIDIC's attitude and policy towards relevant issues of consulting engineering activities have been prepared by Client/consultant Relationship Committee and approved by Executive Committee of FIDIC as policy statements. These statements concern the following aspects of the Client/consultant activities:

- selection, engagement and remuneration of consulting engineers,
- role of the consulting engineer during construction,
- role of consulting engineer in turn-key projects,
- guarantees, bonds and retentions relating to professional services,
- transfer of technology.

The FIDIC's policy principles, expressed in above statements, have very much influenced the contract documents, specially those setting up the general conditions and model form for agreement between Client and Consultant.

4) CONTRACT DOCUMENTS

Within FIDIC, as an international association of consulting engineers, which acquired great professional reputation during its existence, particularly in the last forty years, there have been elaborated two different types of contract documents. One of them gives a model for regulation of contractual relation between Client and Consultant, while the other one relates to the contracts between Employer and Contractor in matter of civil works or electrical and mechanical works.

On next page we will draw up the most significant features and brief outlines of these two types of FIDIC's contract documents, without entering more deeply into particularities of each of these documents.

A/ Consulting Services

There may be several reasons for Client to choose a consultant, like:

- lack of experience and know-how,
- lack of specialist personnel,

- lack of knowledge of international market,
- transfer of technology etc.

According to the principles of FIDIC's Statutes the client will be always looking for some important factors in obtaining consulting services. These will be the factors like:

- Competence of consultant: technical skill, experience and ability to perform the assigned services on the basis of technical and economic principles to provide solution in the best interest of the Client.
- Management ability: to plan, coordinate, execute, cooperate with third parties and control the work to match the size and nature of the project.
- Reputation and professional integrity: the trust between Client and Consultant which involves both the smooth development of the project and matters of confidence, security or political sensitivity.

The Consultant usually provides the following consulting services:

- Pre-feasibility studies (inspections, reports and pre-investigation studies),
- Feasibility studies (economic analysis, technical reports, environmental studies),
- Designs (preliminary, final, architectural layout drawings),
- Tendering procedures (prequalification, tender documentation, tender evaluation, contract award),
- Contract supervision (on site supervision, factory inspection and testing, project management),
- Operation, maintenance and training services,
- Transfer of technology.

In the field of consulting services the first document elaborated within FIDIC in 1963 was:

International Model Form of Agreement between Client and Consulting Engineer and International General Rules of Agreement between Client and Consulting Engineer (IGRA 1963), First Edition, May, 1963.

This document was based on the principle of the unique form of agreement for all types of services provided by consulting engineer. However the position of Consulting Engineer has not been the same in performing of pre-investment studies as of designing and supervising. The difference is not only in type and volume of services, but also in duties of consulting engineer towards Client, consulting engineer's liability, as well as Client's obligations towards Consulting Engineer.

Since IGRA 1963 document did not reflect these differences FIDIC has replaced it by two new documents for each of two mentioned types of services:

- 1) International Model Form of Agreement between Client and Consulting Engineer and International General Rules of Agreement between Client and Consulting Engineer for Pre-Investment Studies (IGRA 1976 PI).
- 2) International Model Form of Agreement between Client and Consulting Engineer and International General Rules of Agreement between Client and Consulting Engineer for Design and Supervision of Construction of Works (IGRA 1976 D and S).

Both of these two documents were revised in 1979 (IGRA 1979 PI, IGRA 1979 D and S).

In the 1976 version of these documents General Rules consisted of only one part named "Conditions of Engagement" divided in nine subsections dealing with analogous subjects and leaving to the parties possibility to complete a number of provisions, like: Ruling Language, Law Governing Agreement, Serving of Notices, Commencement Date, Completion Date, Liability of Consulting Engineer, Settlement of Disputes.

Both of two documents were inserted with several appendices:

- A) Terms of Reference,
- B) Consulting Engineer's Personnel,
- C) Remuneration and Payment,
- D) Counterpart Personnel, Assigned Specialists, Equipment and facilities to be provided by the Client.

With no intention to analyse all provisions of these documents, it should be noticed that the liability of Consulting Engineer has been limited in a way that he was liable only for the consequences of errors and omissions arising from gross negligence on his part or on the part of his employees.

The amount of Consulting Engineer's liability is not any more limited up to contractual sum, like it was in IGRA 1963 document, but should be stipulated by one of the provisions of General Conditions (Clause 2.4.2. IGRA 1976 PI, Clause 2.4.2. IGRA 1976 D and S).

The 1979 version of these documents, due to the fact that - besides the numerous clauses which could be universally applicable - there were some clauses that must necessarily vary depending on circumstances and locality in which the services would be carried out, has grouped the clauses of universal application into Part I - STANDARD CONDITIONS, and the variable clauses, that must be specially prepared to suit each particular agreement into Part II - CONDITIONS OF PARTICULAR APPLICATION. The later are e.g. clauses concerning: Language/s and Law, Notices, Authorized Signatories, Commencement Date, Completion Date, Financial

Liability of the Consulting Engineer, Expiry of the Liability of Consulting Engineer etc.

The Standard Conditions are linked with the Conditions of Particular Application by the consecutive numbering so that Part I and Part II together define the rights and obligations of the parties.

The liability of Consulting Engineer has been modified in the version 1979 of IGRA PI and IGRA D and S documents.

There is a new wording of the clause 2.4 according to which "the Client shall indemnify and hold harmless the Consulting Engineer for and against any and all claims, damages, expenses or costs (including those asserted by third parties) directly or indirectly related to the services to the extent that such claims, damages and expenses exceed in total the Consulting Engineer's liability as stated in Part II of the agreement.

According to the same provision "This indemnification and hold harmless by the Client should not apply in cases where such claims, damages and expenses arise from gross negligence or criminal action from the Consulting Engineer".

The expiry of the liability is agreed upon by both parties.

As a result of new developed activity of Consulting Engineer, due to the growing size and complexity of projects, which increased the time required for project execution as well as rapid escalation of cost investment, FIDIC created in 1980 a new document: International Model Form of Agreement between Client and Consulting Engineer and International General Rules of Agreement between Client and Consulting Engineer for Project Management (IGRA 1980 PM).

According to Introduction of this document PROJECT MANAGEMENT has been defined as "The mobilization, under a single responsibility, of a multi-discipline team required to implement the project within the owner's objectives of schedule, quality and costs".

The structure of IGRA 1980 PM document corresponds to what has been said for IGRA 1979 PI and IGRA 1979 D and S documents:

Two main parts are:

- 1/ International Model Form of Agreement
- 2/ International General Rules of Agreement, containing:
 - Part I Standard Conditions
 - Part II Conditions of Particular Application.

Besides three appendices concerning:

- A/ Scope of Services,
- B/ Assigned Specialists, Personnel, Equipment and Facilities Provided by the Client,
- C/ Remuneration and Payment.

there is inserted so called "Important Notice on Professional Liability" referring to the Clause 2.3.4 of Part I - Standard Conditions dealing with Provision of expert technical advice and skill. The Notice suggests that Project Manager may arrange for the provision of special technical advice or assistance beyond that committed under the Scope of Services (Appendix A), but should not attempt to give advice upon matters in which he is not qualified. Moreover, Notice suggests insertion in Part II of agreement of an appropriate clause.

The services expected to be provided under the agreement form project management are:

- Economic feasibility analysis,
- Financing,
- Transfer of technology,
- Resource management,
- Environmental impact,
- Engineering,
- Procurement and contracting,
- construction management.

The liability of the Project Manager has been defined in the same way as it has been in to precedent IGRA 1979 documents.

The Notice on professional liability draws the attention of prospective parties to engineering services contracts in completion of all IGRA documents to the relevant appendix in the FIDIC publication "Guide to the Use of Independent Consultants for Engineering Services".

B/ Works of Civil Engineering Construction

The best known international general conditions for works of civil engineering construction are those published by FIDIC. First edition of these conditions was prepared by FIDIC and FIBTP (Fédération internationale de batiment et des travaux publics) in 1957 under the name:

"Conditions of Contract (International) for Works of Civil Engineering Construction with Forms of Tender and Agreement".

This document was largely based on English "ICE Conditions of Contract" (fully named: "General Conditions of Contract and Forms of Tender, Agreement and Bond for Use in Connection with Works of Civil Engineering Construction, Fourth edition, January, 1957).

The 1957 first edition of the so called RED BOOK was revised several times:

- Second edition in 1969, which included the Part III covering dredging and reclamation.

- Third edition in 1977, incorporating changes based on nearly 20 years of experience.
- Fourth edition in 1987, published in two separate volumes:
 - Part I - General conditions with Forms of Tender and Agreement
 - Part II - Conditions of particular Application with Guidelines for Preparation of Part II Clauses.

In other words, Part II represents the explanatory material and example clauses with purpose to assist the parties in preparation of Part II clauses.

During the preparation of the fourth edition of Red Book FIDIC, and specially its Civil Engineering Contracts Committee, has received numerous suggestions and comments from European International Contractors (EIC) as mandatory of Confederation of International Contractors Associations (CICA) with participation of Associated General Contractors of America (AGC).

The basic aim of the Red Book, according to Mr. Mortimer Hawkins at the International conference on FIDIC documents in Dubrovnik, May, 1988, is: "to establish a working relationship within which an Employer can expect to receive from an efficient Contractor a soundly executed project within a reasonable time and at an economic cost".

The changes and improvements of the fourth edition of Red Book are the following:

- The word "International" has been deleted, what implies the use on the national market too.
- Language and layout have been modernized and simplified, but numbering and sequence of clauses remained the same.
- Part II (Conditions of Particular Application) has been enlarged with model clauses and now incorporates Part III from third edition.
- The basic role of Engineer has been maintained, but the role of the Employer has been more emphasized.
- The payment clauses are now more detailed.
- Procedures have been spelled out and more clarified.
- The settlement of disputes has been revised.

Although the terms of the fourth edition of Red Book have been recommended for general use in cases where tenders are invited on an international basis, they are equally suitable for use on domestic contracts.

The clauses which can be generally applicable are grouped together in this document and referred to as Part I - General Conditions. They have been already prepared in a form that can be included as printed in the contract documents normally prepared.

Conditions of Particular Application (Part II) are linked with General Conditions (Part I) by corresponding numbering of the clauses. They must be specially drafted to suit each individual contract.

Both Part I and Part II comprise the conditions governing the rights and obligations of the parties.

The Guidelines for preparation of Part II clauses is intended to assist the parties in this task by giving options of various clauses where appropriate. There are more reasons for existence of Part II clauses:

- Since the wording in some Part I clauses specially require that "further informations are to be included", Conditions would not be complete without that information.
- Sometimes wording in Part I indicate that supplementary information may be included in Part II.
- Sometimes the type, circumstances or locality of the works necessitates additional clauses.
- In the case that the law of the country or exceptional circumstances necessitates an alteration in Part I, such alteration should be effected stating in Part II that a particular clause, or its part, in Part I is deleted or modified and giving the substitute clause.

In some cases, as far as possible, example wording has been provided, and in some other only an aide-memoire for the preparation has been given.

C/ Electrical and Mechanical Works

Different nature and the content of the contract for electrical and mechanical works from the contract for works of civil engineering construction caused creation of conditions of contract for electrical and mechanical works. The main differences relate to some of the aspects of these two types of contract:

- Content: civil projects generally involve bulk operations (e.g. earthworks, concrete works), while electrical and mechanical works usually involve specialist work (e.g. supply of machinery and equipment).
- Design for civil projects is usually done for Employer by Consulting Engineer, and for electrical and mechanical projects mostly by Contractor.
- Execution: civil works are normally performed on site, electrical and mechanical works mostly off-site.
- Measurement: civil works are usually subject to measurement of work executed based on Bill of Quantities, and electrical and mechanical works are often related to unit rates for major items of plant on the basis of Schedule of Rates.
- Value of manufactured and erected equipment is usually much higher than the value of civil works.

- There are some issues in electrical and mechanical works like: equipment, delivery, erection, commissioning, guarantees for equipment, which do not exist in civil works.

These were the reasons for FIDIC to publish in 1963: "Conditions of Contract (International) for Electrical and Mechanical Works (Including Erection on Site) with Forms of Tender and Agreement, First edition, May, 1963", known as YELLOW BOOK. This document was largely based on English, so called, "Model Form B 3" (I. Mech. E. and IEE, London) - regarding manufacture and delivery, as well as on first edition of Red Book - regarding work on site.

On the basis of 17 years of experience the second edition of said general conditions was published in 1980.

The third edition was published in 1987 under the name: "Conditions of Contract for Electrical and Mechanical Works Including Erection on Site with Forms of Tender and Agreement". In preparation of this document the Electrical and Mechanical Contract Committee of FIDIC has received the advices and comments from Organisme de liaisons des industries métalliques Européennes, Bruxelles (ORGALIME), but solely took all decisions concerning the content of the document.

The word "International" has been here also deleted, what implies the use of the document on the internal (national) level too.

The most significant changes from the second edition are the following:

- Simplification of the text and terminology,
- Restructuring of layout and rearrangement of clauses,
- More Employer's involvement by introduction of "consultation" in matters affecting payment and time,
- Rationalized provisions regarding liability and insurance,
- Revised and clarified procedural conditions for dealing with Variations and Claims.

Consulting Engineer (here called: Engineer) maintains his basic and very important role in relationship between Employer and Contractor, but his role in matters of disputes has been, however, little bit weakened: The Arbitrator(s) shall have the full power to open up, review or revise any decision or instruction of the Engineer or any certificate related to dispute.

The structure of third edition of Yellow book consists of following parts:

- Preamble
- Part I - General Conditions
- Part II - Special Conditions
- Index
- Tender

- Contract Agreement

All clauses in Preamble must be completed and only then can constitute, together with other parts of Agreement, a contract on the basis of General Conditions (Part I).

According to Contract Agreement the following documents shall be deemed to form the Agreement:

- a) The Letter of Acceptance
- b) The Preamble
- c) The General Conditions (Part I)
- d) The Special Conditions (Part II)
- e) The Specification
- f) The Schedules
- g) The Employer's Drawings
- h) The Contractor's Drawings
- i) The Tender.

In order to assist users of this document FIDIC anticipates in preparing of "Guide for Use of FIDIC Conditions for Electrical and Mechanical Works".

It has to be mentioned in the matter of electrical and mechanical works the FIDIC Yellow Book is in the use mostly in relations between the parties from developed and developing countries. Parties from developing countries in their business relations make use of "General Conditions for the Supply of Plant and Machinery for Export (No. 188", or General Conditions for the Supply and Erection of Plant and Machinery for Import and Export (No. 188 A)", both of them prepared under the auspices of the United Nations Economic Commission for Europe.

5) CONCLUSION

The intention of this rather brief presentation is to show that FIDIC contract documents play today very important role in contracting of both engineering services and civil works as well as electrical and mechanical works on national and international market.

All presented documents, and particularly those relating to civil works as well as to electrical and mechanical works have been strongly based on English general conditions and English law (Common Law). That was a reason that international practice of contacting relayed on English law and English interpretation of relationship between participants in such contracts. All participants not belonging to English legal system (Common Law system) had problems and difficulties in understanding of those documents, specially because of quite old fashioned language in their first editions. Moreover, some particular legal institutes of Common Law unknown to the contractual parties belonging to continental European legal

system(s) made some clauses less understandable and their application impracticable.

This was the main reason for modification of the said documents towards their, let us say, "internationalization" making them closer to legal and operational institutes known in other legal systems.

The first considerable change was that one of the second edition of FIDIC document for electrical and mechanical works. The Common Law institutes, like "liquidated damages" and "maintenance period" were in this edition deleted and replaced by other institutes better known and common to European continental law and practice.

The farther changes occurred in subsequent editions of both Red Book and Yellow Book. They contributed to stronger "internationalization" of FIDIC documents and confirmed their growing importance for all participants in complex projects: Clients/Employers, Contractors, Consulting Engineers and others.

The acceptance of FIDIC documents, with some minor modifications, by international financing institutions, particularly by the World Bank, is one more proof of essential and significant role of FIDIC documents in international business practice.

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