

PROCUREMENT IN THE CONSTRUCTION INDUSTRY

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INDEVELOPMENT

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1 INTRODUCTION

One-off production process

The construction industry differs from most other industries, because it tends to produce a one-off prototype, whereas the other industries are mass producers. Only when the prototype emerges as a model and is replicated, the constructions can be compared with mass products.

Clients

Unlike with mass production, the client usually takes the initiative to have constructions designed and build. The client is the actor who pays for the construction. The client may sell or let the construction later. Thus the client is the one who orders the construction.

There are various kinds of clients. It is possible to classify them on basis of their orders for constructions and their capacity to design and build them:

- Clients with an one off construction requirement
- Organisations that regularly undertake development, but rely wholly on external resources or agencies to implement them
- Organisations with major development programs, directly employing technically skilled staff

Force account operations

The last kind of clients may design and build the construction completely themselves. Many public works were constructed under administration or force account operations. Even large real estate agents may operate this way.

Force account operations are becoming more and more unpopular. Not only because of inefficiencies of public sector organisations but also because of certain advantages of involving the private sector. Competition between providers results in efforts to improve the technology and reduce the costs. The developments in technology has resulted in a situation that it is often difficult or costly to have in-house capacity to apply all these technologies. The contracts force the clients to think before implementation. This behaviour increases the efficiency of the construction process.

Exception to the rule

Thus it is widely believed that private sector involvement improves the quality and reduces the costs of the works. Nonetheless even in modern societies, these large clients not always procure these goods and services from the private sector. In particular the national line agencies may implement the works under their administration. The market for certain operations may be small that it is not interesting for the private sector to develop specific skills or technologies, the line agencies have no other choice than to implement the works themselves. The private sector is also not always the most cost-effective provider. When the public sector is confronted with inflated prices, it may reject all proposals and implement the works themselves. A positive side effect of works under administration is that the clients maintain a good feeling with production technologies and update their unit rates.

Marketing efforts

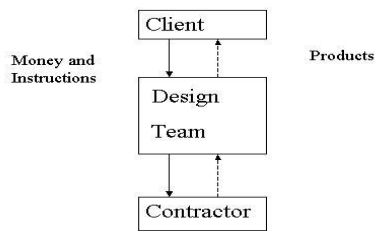
The consultants and contractors have tried and continue trying to develop markets for their services and goods. They have developed several public-private partnership models, often pre-financing the initial costs of construction to the clients. They also try to convince potential clients by providing, free of cost, feasibility studies of potential projects. Some consultancy firms and NGOs active in slum upgrading projects broker (cost-sharing) deals between the government, external donors (including the private sector) and project beneficiaries.

Procurement

This document concentrates on the different procurement systems. It excludes force account operations and public-private partnerships.

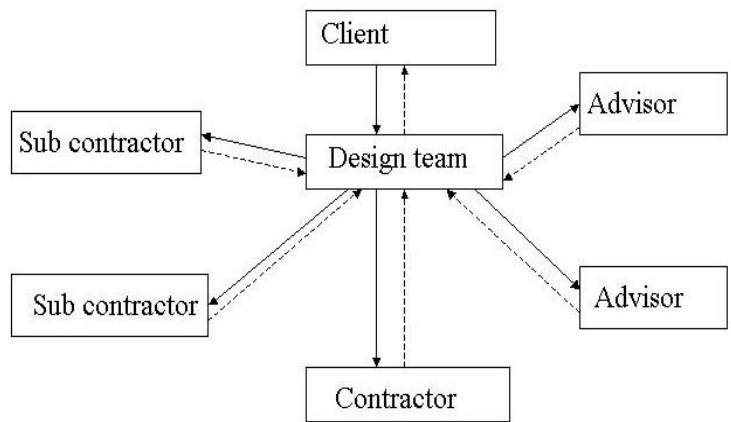
2 PROCUREMENT PATH

The client can engage the private sector for various activities, like building, operation & maintenance, designing, and conducting feasibility studies. Depending on their in-house capacities, understanding of the construction process, the construction itself and the demands of the client, the client has to define a procurement path.



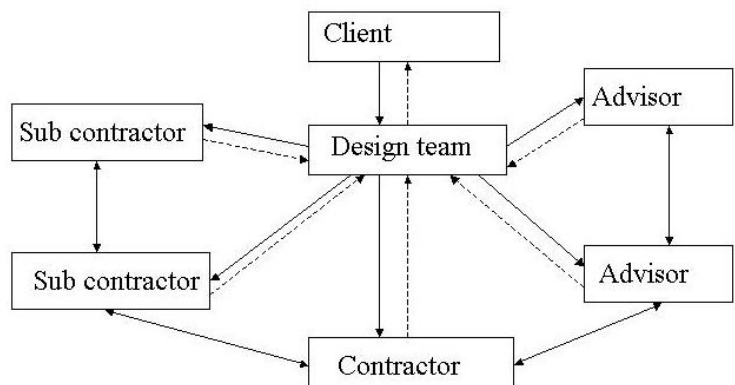
The most common form of procurement is general contracting. The client engages a design team. The design team designs but it also engages a contractor on behalf of the client. The contractor only has a relationship with the design team. This model is only useful for simple and straightforward works.

Many constructions nowadays require multidisciplinary skills during the design process. The design team, often an architect needs support from specialists, like constructors and specialists in installation techniques. The design team may therefore have to procure services of advisors and subcontractors. It is often necessary to involve subcontractors in the design process, because they need to tailor their designs to the main design of the construction.

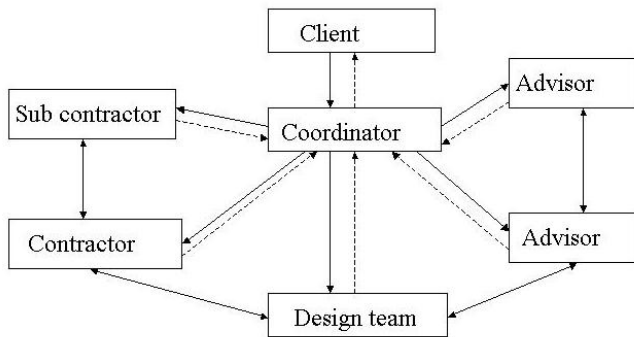


The difficulty with the above-presented model is that design team needs to coordinate the inputs of the different advisors. A lack in coordination often results in mismatching design inputs and construction inputs.

In most situations, the contractor has to fill in or adjust the design provided by the design team. For example the contractor ensures that the tolerances of materials matches. Furthermore, the contractor plans the delivery of the inputs. The procurement time of specialist equipment may take more than the entire construction process. It may be necessary to procure works from subcontractors well before the start of the construction.

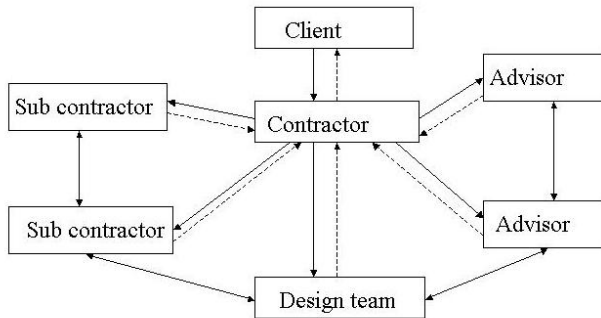


The contractors also can advise the design team on practical implications of their designs. It may therefore be possible that the contractor is already engaged during or before the design phase.



Many design teams have frustrated clients, contractors, subcontractors and advisors by concentrating on their design inputs and neglecting their coordination function. Instead of appointing a design team, the client may appoint a management contractor. The management contractor may effectively join the design team, to advise on management and production issues, ensure timely involvement of the subcontractors and advisors.

Alternatively the management contractor may take over the coordination role of the design team. The client together with the management contractor selects all the other parties.



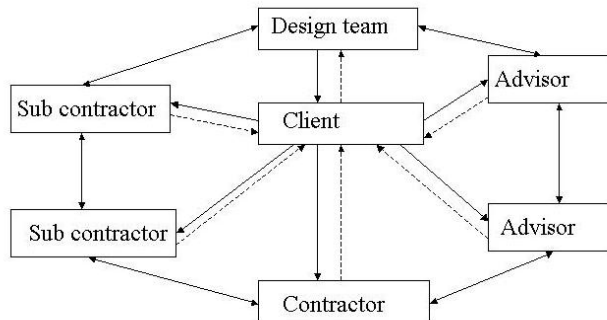
Under design and build arrangements, the contractor takes on the complete responsibility for design and construction. It places more responsibility and liability on the contractors than any other form of procurement. Unlike with general contracting the lead designer does not certify the works of the contractor.

Turn-key

A special form of design and build arrangements are the so-called turnkey contracts. The clients procure the construction like it is buying a standard (mass produced) product. It is difficult for the client to influence or control the quality of the works.

Single-point

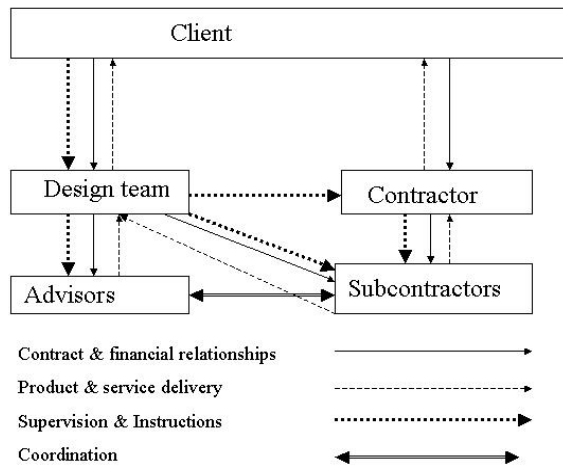
The above-presented models are single-point models. The client has a contract with one organisation. This organisation ensures the realisation of the construction. The client delegates a large part of control to this organisation.



Not all clients fancy these arrangements. Clients may want to be able to review their decisions on basis of results of feasibility studies, or may want to postpone the construction activity. Also many clients want to be able to control the design. Those clients often have series of contracts with their partners. Each contracted partner is only liable for its-own inputs. The client coordinates the construction process through interlocking agreements, specifying the role of each participant.

This multi-point model has also advantages with regard to contract formulation. It is easier to formulate contracts for specific products. The multi-point model allows clients to break the construction process in orderly and manageable portions. Each portion ends with a concrete product or service, like a sketch design, detailed design, tender documents, the construction and quality control.

Often clients may opt for breaking down their contractual obligations. They may first appoint a design team. The design team with assistance of specialist firms, including subcontractors may develop an integrated design meeting the specifications of the client. After the client accepted the design and finds the design feasible, it signs the contract with a contractor who builds the design. The design team is still under contract or contracted again to monitor the progress and quality of the works.



The contractor may either engage its own subcontractors or may have to work with subcontractors appointed by the design team. If the client or its design team selects the subcontractor, the subcontractor is nominated. Regardless who selects the subcontractor, during the construction phase the contractor manages and coordinates their activities. Often the main contractor is entitled to an extension of time when a nominated contractor delays the work.

3 CONTRACT FORMULATION

The contracts in the construction industry are often based on standard contract documents, like FIDIC, the New Engineering Contract and ICE forms. Although these documents are adaptable tools and should be considered as guidelines they are often seen as standards.

There is not a single definition of a contract. However many in the construction industry agree that contracts should contain the following information:

- Objectives of project
- The environment in which the works will take place
- The constraints of the project
- What each party has to do
- Deadlines for outputs, activities, tasks
- Provisions for *What if* scenarios
- Pre-defined mechanism for payment
- Information about the project results and activities

Most contracts for construction work consist of four elements:

1. Articles of agreement
2. Drawings and bill of quantities
3. Specifications
4. Conditions of Contract

Articles of agreement

The articles of agreement provide information about:

- Client
- Client representative
- Contractor
- The contract documents
- Price

This document is signed by the contractual partners (client and contractor).

Drawings

The drawings provide a visual description of the work. It answers an important question:

- What has to be built?

Bill of quantities

The list of quantities describes, preferably in chronological order of operation, the nature and quantity of all components of the construction, the so-called items of work. It also indicates the basis of payment for each component; lump sum or remeasurement. The contractor uses the bill of quantities to calculate the costs of the project. The contractor usually has to provide its unit rates and the total cost per item of work. Most contract forms require that the total cost per item of work is based on unit rates quoted by the contractor and the quantity provided by the client. Other contract forms demand that the contractor provide its own quantities in the bid and that the cost per item is based on result of the equation

between the unit rates and quantities quoted by the contractor. Another type of contract would require the contractor to provide unit prices, but the cost per item are not necessarily based on the unit rates.

Lump sum

Lump sum arrangements mean that the price is determined prior construction. Thus regardless the actual quantity delivered, the contractor is paid the same, provided that the work is delivered. Such fixed price arrangements require that the works were defined at the tender stage. However this is often not possible or appropriate. For example soil conditions vary considerable and it is often considered unfair to transfer the risk of extra work (and costs) to the contractor.

Remeasurement

If the item is to be paid on basis of remeasurement at the end of the project/activity, a provisional quantity is indicated in the bill of quantities. Typical forms of contract in the civil engineering world, e.g. FIDIC, arrange payments on basis of remeasurement.

Regardless the clients Bill of Quantities, the contractor usually estimate the quantities again. To do this the tender documents should contain the reference conditions for the basis of the bill of quantities. This is in particular important for ground works. When the clients and contractors quantities differ, the contractor will assess the financial consequences.

Under lump sum arrangements, the contractor is concerned to be reimbursed its costs. Remeasurement arrangements are less risky for the contractor as they are more or less guaranteed that their cost will be reimbursed. When the contractors have to quote prices against the client's quantities, they may alter their unit prices in order to speculate on additional profit. To develop the most competitive bid, they simply lower their profit percentage or are even willing to make a loss (on paper).

For example under remeasurement arrangements, contractors **may** market up their unit prices, if they expect that the quantities were underestimated. Because of the remeasurement arrangements, the contractor expects to be reimbursed for the actual work on basis of these higher unit prices. Under lump sum arrangements the contractor **has to** market up its unit rates to get its real cost reimbursed when the client underestimated the quantities.

Client's estimate

In some countries the client's estimate is provided to the bidders. It is argued that it provides some guidance to less experienced bidders and otherwise it is expected that some bidders will receive this information through illegal practices. Thus the provision of client's estimate is better for the weaker firms. The main disadvantage is that many contractors will quote prices within a certain range of the client's estimate, afraid for being disqualified.

3.1 SPECIFICATIONS

The specifications have the objective to provide information about the requirements towards the to build product. Most of the requirements are related to quality. Basically there are two different methods of quality assurance:

1. Performance specifications
2. Descriptive specifications

Performance specifications require tests to determine whether the product is of satisfactory quality. It is not concerned with the technology used to construct the product. The choice of the production technology is left open to the contractor. The contractor is often obliged to test the quality of the works itself. He/she has to store the test results for a particular period for evaluation by the client or its representative.

However testing is not always possible or the best approach. Descriptive specifications describe the technology that has to be applied. Contract documents and especially specifications are management tools. If the client or its representative expect that it is difficult to find competent contractors, the client may wish to provide detailed instructions about the work procedures to control the quality. Clients, who have additional concerns, like poverty alleviation or the health and safety of the workers, may also order contractors to use specific technologies, like labour-based technology or to follow the health and safety guidelines.

Standard specification frameworks assist projects with the formulation of specification clauses. Ideally these frameworks should be technology neutral documents and present all possible specifications.

Design work

It is seldom easy to define the scope of work and therefore to develop specifications for design works. In other words quality control of designers is often impossible. It is also often counter productive as most designers perform better under freedom, when they can apply their creativity. Note that quality system elements were only developed for production processes.

Nonetheless it is recommendable to include elements like

- Formulating a schedule of requirements
- Drawings for Approval
- Design review and verification
- Testing of prototype
- Amending design

in the specifications or terms of reference.

The purpose of the design review and verification and testing of the prototype is to ensure that the product conforms to the schedule of requirements. There is usual a provision in the Conditions of Contract that approval shall not relieve the contractor/consultant of

his liabilities.

Ideally the grounds upon which the client or its representative may refuse to approve the drawings should be set out in the contract, like the drawing does not comply with an express provision in the contract or schedule of requirements or that it is contrary to good engineering practices.

Process plant contracts

Process plant contracts, like water treatment plants or sewer treatment systems usually differ from other construction contracts.

A process plant is more than just a collection of civil, mechanical and electrical engineering components. The plant facilitates a particular process. However good the components, if the plant does not perform, it has no value to the client.

In general a process plant contract has three phases:

- Design and construction of the plant
- Commissioning and setting to work of the process
- Optimisation of the process

Each of the three phases requires a separate set of tests to determine if the delivery is satisfactory.

Completion tests

After the construction of the plant is completed, the contractor carries out so-called completion tests. These tests are similar to tests in other construction projects. The tests have the objective to investigate if the construction meets the design and quality standards.

Takeover tests

Before the process plant is handed over to the client, the contractor tests if the plant functions properly. These tests are called the takeover tests.

Performance tests

Construction plant contracts usually have considerable longer guarantee periods than regular construction contracts. During the guarantee period, the client carries out the performance tests under the supervision of the contractor. If the plant fails the tests, the contractor may attempt to adjust the plant to improve the performance. Damages become payable if the plant fails to meet the guaranteed standard of performance within a defined period.

Agreement as to exactly what the guarantee covers and measurement of the guaranteed parameters is difficult. In the water industry there are particular difficulties in relation to quality. For example the feedback (e.g. raw river water or raw sewerage) may have different characteristics from those envisaged in the contract.

3.2 CONDITIONS OF CONTRACT

The conditions of contract are usually based on basis of standard forms of contract. However clients may wish to alter bits and pieces of these contracts to their advantage. Nonetheless clients should be fair to their bidders and indicate the standard form of contract and which clauses were amended. Many inexperienced clients may opt to use standard form of contract, as amending clauses is a time-consuming and risky activity. The contract document should be coherent with the existing legal framework. The law interferes with the contract with regard to risk assessments. But the laws are often open to different interpretations. In general, more specific contract documents reduce uncertainties, disputes and interference of arbitration and the law.

Contents of conditions of contract

The contract should describe

- Contract period & deadlines
- Tasks and responsibilities of each party
- Method of payment
- Retention money
- Payment for extra work and variations
- Price fluctuations
- Notices and fees to be paid to authorities
- Insurances and indemnities
- Liquidated damages
- Conditions under which extensions of time may be granted
- Conditions for termination of contract
- Arrangements for arbitration
- Provisional sums
- Claims for loss and expense
- Record keeping
- Health and safety plans

Risk assessment

For all parties it is important to assess the consequences of these clauses on the practical and financial impacts of hazards. Contracts do not deal with apportionment of risk as such, but with broad commercial obligations, which are subject to exceptions. The exceptions are usually based on specified risks. Both the commercial obligations and the exceptions provide information about the responsibilities with regard to dealing with risks. In most standard form of contracts it is not clear who bears the risk. The parties often do not know who is to pay and who takes the decisions. The clearer the risk management is described in the conditions of contract the smoother the implementation of the works.

Contract period

The contract period is the starting and completion dates of the contract. Most contractors need a couple of weeks to mobilise labour, equipment and materials and the client have to do some unfinished business on the site, the contract may therefore include "date for possession of the site".

The start and finish dates are seldom sufficient information for the

client to manage the timeframe of the project. It is often recommendable to include deadlines for certain milestones.

Method of payment

Very short and most consultancy contracts are often paid upon satisfactory completion of the work. But most other contracts have interim payment (instalments). Basically there are two systems for paying instalments:

1. Cost checking system
2. Milestone or time-based payment mechanism, based on a proportion of the contract price

Cost checking system

Under the cost checking system, the contractor is either simply reimbursed for its expenditures during the last period or advanced for its costs for the coming interval. Advancing the costs gives smaller contractors more opportunities to participate in the construction industry.

Advance payment

To calculate the advance, the following equation is used:

- | | |
|----------|--|
| 1. | The agreed estimate of the costs the contractor will incur in the period following the payment application |
| Plus 2. | The actual costs incurred in the period prior to the period of the payment application |
| Minus 3. | The previously agreed estimate of the costs at (2) |

Milestone payments

Under milestone payments the contractor is paid whenever he or she delivers a semi-finished product. The payment consists of the agreed price for that specific semi-finished product minus a percentage for the retention fund.

Time-based mechanism

Under time-based mechanism the contractor receives an agreed portion of the contract price, provided that the progress is acceptable to the client. Most clients will refrain from these payment arrangements. However if the contractor is a reliable partner, e.g. co-finances the project, the (other) clients may opt for time-based mechanism.

Retention Money

Most clients deduct a fixed percentage of the instalments and held it in a retention fund. The contract should specify the percentage deducted and maximum limit of the retention fund. The retention funds have the purpose to protect the client against all kind of difficulties arising during the construction. A part (specified in the contract) of the retention fund is released when the certificate of practical completion is issued. At the end of the defects liability period the client releases the remaining balance.

Payments for extra work and variations

The contractor may be asked to carry out some extra work. This work is usually not a problem unless the contractor has to demolish and redo earlier work. Extra work can be applied for work items with remeasurement payment systems. However variations may also involve work items for which the contractor did not yet provide the prices. Depending on the contract and the law, the contractor may have to quote a price, before the engineer can order the variation on behalf of the client. The variation is than merely a collateral contract

appended to the original contract. Exceptions are often allowed for emergency works.

Price fluctuations

The contract specifies if the contractor is allowed for additional payments for inflation correction. This is in particular of interest for long projects in countries with high inflation rates.

Notices & fees for local authorities

The contract also provides information about the responsibilities to notify the local authorities about the building activities and pay the fees involved. Some local authorities may charge stacking fees for stacks of materials located on public land. As only the contractor has control over the storage information, this is clearly his/her responsibility. The client may be more suitable to take up other issues.

Insurance and indemnities

Most contracts specify that the contractor have to insure himself and indemnify the client against any claims due to the construction process. The insurance should cover damages to the construction. Examples of claims are fatal, injuries and damages to workers or third parties. Often the contractor has to submit a copy of the insurance policies prior commencing the site. The contractor is also responsible for the acts of the subcontractors. As a part of the subcontractors in low and middle-income countries belong to the informal sector, the contractor may need to insure himself for the actions of these unregistered firms.

Such clauses are only possible when insurance companies provide these types of insurance policies. The contract documents and tender procedures should follow the available insurance policies. For example, in many low and middle-income countries, small contractors face difficulties to obtain bonds from insurance companies. Nonetheless most contracts require the contractor to insure the client against the risk of non-performance by the contractor. The contractor may go bankrupt or may fail to complete before the deadline, resulting in a loss of income to the client. Sometimes the client needs to appoint another contractor to complete the works, incurring additional costs.

Liquidated damages

The penalty for not completing the works on time is called the "liquidated damages". The contract should specify the amount per time unit of delay and the total amount of the liquidated damages. It may be expressed as percentage of the contract sum or presented in local currency.

Extensions of time

Most contracts specify the events when extensions of time are granted. Typical relevant events are:

- Exceptional Adverse weather
- Insured risks or specified perils
- Civil commotion, strikes etc
- Variations
- Provisional sums
- Postponement by the client
- Named and nominated subcontractors
- Late instructions

Ideally the contract would specify precisely under which circumstances the extension of time will be granted and when not. The extensions of time often result in disputes between the contractor and the client.

Termination of contract

The contract also specifies under which circumstances the contractual parties may decide to terminate the contract.

When one party terminates the contract, the client has to pay the contractor for the works, materials delivered, the costs for removing equipment and plant from the site. Often termination of contracts result in disputes about other damages caused.

Typical circumstances under which clients may terminate the contract are:

- If the contractor subcontract major parts to other firms without prior permission
- Contractor ignores written notices to correct damages or unsatisfactory work
- Bad workmanship
- Unacceptable progress

Contractors are usually allowed to terminate the contract, when the client goes bankrupt, does not pay instalments or stops the works for exceptional long periods.

Arbitration

Disputes Review Board, Panel of Experts and Adjudicator are all names for arbitration commissions who are assigned to resolve disputes in the construction industry. Arbitration is expensive to all parties and often it pays off to settle the disputes prior going to an arbitration commission or court. The cost of defending or fighting a claim may be as high as the claim itself.

Provisional sums

A provisional sum is a sum of money set aside in the bill of quantities by the client for unforeseen works, such as pumping in the event of a flood¹. It is a method for the client to manage risk. For each possible risk, the client has identified a risk mitigation measure; the bill of quantities should include a provisional sum. The contractor quotes a unit rate on basis of the provisional sum estimated by the client.

Named subcontracts are usually taken up as provisional sums. In

¹ John S. Scott: Dictionary of Civil Engineering, 1991, The Penguin

this case the principle contractor has to work with subcontractors appointed by the client. The contractor has to contract and pay these firms.

Loss and expense claims

Most contract contain standard clauses like *"The contractor is permitted to claim loss and or expense in addition to the prices fixed on condition that the contractor has suffered loss for which it would not be reimbursed by a payment under any other provision of this contract."* Variations, provisional sums, nominated and named subcontractors, approximate quantities, delayed possession, late instructions, postponement of work, failure to give access to the site are all reasons for contractors to submit loss and expense claims. Loss and expense claims result often in disputes between the contractor and the client.

Record keeping

The conditions of contract usually include clauses about the records the contractor has to maintain and make available to the client at any given time. The contract specifies the contents of each record, the way it has to be filed, duration of filing obligation and when a copy of the records should be submitted to the client.

Health and safety plan

Modern contract documents include regulations about development of health and safety plans. The contractor is required to agree with the insurance company about the registration procedures and format of accidents and other claims. Furthermore clients may demand that the contractor makes the plan available for verification. In addition the client may conduct health and safety audits and remove potential contractors from the register of potential bidders when the contractor defaults health and safety regulations.

4 SELECTING PARTNERS

During the different construction phases the client selects partners to provide inputs in the construction process. Contractor and subcontractors build the construction and may be more or less involved in its design. The client may procure services from architects and consultants to design the construction and engage other consultants to review the design; carry out feasibility studies and evaluations.

Selection arrangement

The question is how and on what basis does the client select these partners? The How question relates to the selection arrangements. Basically there are three options:

- Nominations
- Open competition
- Selective Competition

Nominations

Under the nomination arrangements the contractors and consultants do not compete with each other. The client directly appoints the external partner. The client may do so, because it wants to work with a particular contractor or firm. The client may have a long-term relationship with the contractor. For example the contractor may carry out the emergency works for the client. Or the client likes the designs of a particular architect. Or there are not enough competing providers and therefore competition would be a waste of time and money. Nomination has certain disadvantages. It often leads to inflated prices and it is difficult to guarantee the transparency of the selection process.

Competitive

The public sector therefore opts for competition practices. Private clients have not yet adopted competition as rigorously as the public sector clients. Competition is a transparent process and helps to satisfy the increasing demand for accountability in both the public and private sector. Competition also requires clients and their procurers to think about their needs early in the construction/design process and therefore improves the efficiency of the construction process.

Open competition

The competition may be open to any qualified (registered) firm. Under open competition arrangements, the tender is advertised in newspapers, specialised magazines and other public domains. The client makes the tender document available to each potential tenderer.

The main disadvantages of open competition are the high costs for preparing the bids and evaluating them. The client's representative may have to spend several weeks to evaluate every bid. In addition not all bidders are qualified.

Selective competition

Under selective competition arrangements a number of qualified firms are invited to submit a proposal. The absolute minimum of

invitations is three but often the client invites five or six qualified firms.

There are different ways to prepare the short list. The client or its representative may already have developed a register of qualified firms or the client may invite all interested firms to submit certain details about their firms in an expression of interest. In the latter case the client will in particular review information like:

- Track record on similar commissions (approach, technical ability performance to quality, time and cost constraints)
- Client references
- Professional resources and support facilities
- Qualifications of key staff
- Financial standing
- Adoption of quality management system

However, open competition offers a wider choice and is less open to favouritism. In fact selective competition is very sensitive to corruption, when the client's procurer doesn't have to justify the shortlist. Often procurers are only requested to invite a number of (qualified) companies. Corrupt procurers simply invite 3 or 5 companies on basis of information of the pre-selected winner. The pre-selected winner owns or is strongly related to these companies and sometimes these companies do not even exist. In countries where there are many qualified firms, public organisations may wish to set up a rotation schedule to provide equal opportunities to each company. Public procurers could for example work with a lucky draw to select five qualified companies for the shortlist.

Selection criteria

The external collaborators (contractors, consultants) can be selected on the following criteria:

- Price
- Ability
- Ability and Price

Price

Tendering on basis of price alone may be risky in low and middle-income countries. First of all the contractor or consultant may lack the capacity to carry out the works. Secondly due to pressure to keep the prices low, bidders may undervalue the inputs and accept losses.

Although the low price may be attractive to the client, they are also risky. Due to cash flow problems the contractor may not be able to advance the construction costs or even go bankrupt. As many small contractors have difficulties to insure themselves and provide bonds to the client, the client may actually have to pay considerable more than originally foreseen. Due to the severe competition many external collaborators may simply provide the minimum acceptable. Clients therefore do not receive the maximum quality of service but the minimum acceptable or worse. To protect themselves against such malpractices, clients may specify lower limits with regard to bid. Bids that are lower than a certain amount or percentage of the client's estimate are rejected. The disadvantages of this practice are clear. The client does not receive the lowest price and it does not

provide incentives to contractors to optimise their efficiency. It also enhances corruption. Corrupt procurers and contractors may fix too high client estimates, in the hope that competing contractors will provide realistic estimates. As the realistic estimates are below the cut-off level, the procurer simply rejects their proposals. Cut-off levels are also barriers to new companies that want to enter the construction sector and want to build up their track record by winning bids on basis of low prices. Furthermore it should be noted that quite a few companies are able to absorb the losses. Thus to be fair cut-off levels should be set in correlation with the financial standing of the bidder and in my view should be different per bidder. To control the performance of external collaborator, the client has to be able to specify the quantity and quality of the works. The professional services needed at an early stage in the construction process cannot be adequately described. Until the scope is clear, it is suggested to include ability in the selection criteria.

Selection on basis of price is only acceptable when all expected bidders have sufficient managerial, technical and financial capacities. Therefore it is usually used when the external collaborators are short-listed. And even then the financial proposals of the different bidders may pose different risks to the client. Clients who are familiar with the bidders may add their supervision costs on top of the bidders offers. Some bidders need more supervision than others.

Despite all its concerns, selection on price is simple, straightforward and not easy to manipulate. In particular the latest is important for the public sector that wants to prove its transparency.

Ability

Selection on ability is often applied in the early stages of the project or for projects requiring patented technologies, like process plants. The client may opt to select on basis of ability alone or in combination with a price element. The latter is more popular than the first option. Typical examples of selection on ability alone tenders are project design and technical assistance tenders of the big lender organisations like the World Bank and the Asian Development Bank. Interested bidders are requested to prepare a technical proposal addressing a certain objective and within a given budget. A review team evaluates and marks the technical proposals. The evaluation criteria differ. For simple projects, the criteria may just focus on the deliverables. Which products and which service will the bidder deliver and to what extent will these products and services contribute to achieve the set goals and objective. The technical proposal should therefore describe the relationships between the goals and deliverables.

The evaluation criteria of more complex projects often include an assessment of the technical, managerial and financial capacity of the bidder. For design work the bidders are often solely evaluated on basis of their company profiles. In both cases the bidders have to provide information like;

- Track record on similar commissions (approach, technical ability performance to quality, time and cost constraints)
- Client references
- Professional resources and support facilities
- Qualifications of key staff
- Financial standing
- Adoption of quality management system
- Outline suggestions for approaching the commission
 - Experience of proposed project manager/team leader
 - Organisation of the commission (staffing and resources plan)²
 - Technical, managerial and design method

The client or its procurer may in addition of verifying the above-mentioned information interview the key consultants, which are proposed to work on the project. This practice is recommendable for difficult and complex projects. More and more international consultancy firms operate in low and middle-income countries. These firms are often nothing but a front office and depend solely on subcontractors and freelance consultants. Clients should be aware of the risks involved when it awards contracts to firms that do not know the performance of their consultants. Clients may want to review the relationship between the firm and consultants. I recommend to use firms where the majority of the consultants are either permanent employed or work on a regular basis for the firm.

Tender information

Most tenderers would like to see the evaluation criteria. They argue that if they know the evaluation criteria it is easier to provide the required information. However many clients and their procurers believe that the tenderers should concentrate on the project information. They expect that a successful tenderer is able to extract the evaluation criteria from the project information. The tenderers are simply requested to provide the information under specified headings.

It is not recommended to provide the marks for each criterion and the precise weighting for ability, if used in combination with price. This information limits the procurer's freedom to choose. However, in the name of transparency, the law may force the public sector clients to provide such information to the tenderers. The table below provide suggestions about setting scoring ranges for the different items.

² The clients want to know what the consultant/contractor will provide for the fee quoted.

Criteria	Scoring Range
Overall experience and facilities <ol style="list-style-type: none"> 1. Consultancy's general experience 2. Technical facilities available 3. Consultancy's financial stability 4. Registration or accreditation 	10-30 <ol style="list-style-type: none"> 1. 5-20 2. 5-10 3. 0-10 4. 0-10
Relevant experiences and expertise <ol style="list-style-type: none"> 1. Project manager/team leader 2. Relevant experience of proposed staff 3. Qualifications of proposed staff 4. Personal qualities of proposed staff 5. Special services/sub-contracting 	30-70 <ol style="list-style-type: none"> 1. 5-20 2. 10-40 3. 5-10 4. 5-15 5. 0-20
Approach <ol style="list-style-type: none"> 1. The overall conceptual approach 2. The understanding of client objectives 3. The approach to the commission <ol style="list-style-type: none"> a. Technical approach b. Management c. Work Programme 	20-60 <ol style="list-style-type: none"> 1. 0-40 2. 5-30 3. <ol style="list-style-type: none"> a. 5-20 b. 0-15 c. 5-15
Maximum Score	100

Source: John Connaughton, Davis Langdon Consultancy

Ability and price

There are different possibilities to evaluate proposals on both ability and price. It is possible to breakdown the evaluation process in stages. The so-called two-stage tender process is very popular. The tenderers submit two envelopes. One envelope contains the technical proposal and all the information to evaluate the ability and the other envelope contains the financial bid. Both envelopes should clearly state the contents, the name of the bidder and the name of the project.

The evaluation contains two steps. During the first step all the technical proposals are evaluated and either classified as rejected or accepted.

During the second step the financial proposals of all bidders with accepted technical proposals are opened and ranked. The bidder offering an acceptable technical proposal against the lowest cost is awarded the contract.

Alternatively, the client or procurer may opt for a three-step approach. During the first step, all the technical proposals are evaluated and receive a mark. The proposals with marks above the cut-off mark are accepted and the others rejected. The financial proposals of the bidders with acceptable technical proposals are compared with the budget (client estimate). The financial proposals exceeding the budget are rejected. The bidder with the best (acceptable) technical proposal within the budget is awarded the contract.

Another method is the combined marking system. This system is similar to the ability alone system, with exception that it includes a score range for the price. It is easy to manipulate and more importantly it may award the contract to unqualified bidders.

Therefore combined marking systems should only be applied after screening bidders on their ability.

4.1 TENDER PROCEDURES

Tendering procedures must be fair and workable. The client should treat all tenderers equally.

- Each tenderer should receive the same information, this include responses to questions
- The client should adhere strictly to the timetable for issue, receipt, adjudication and award of tenders.

The client has to provide the tenderers the following information:

- Basis of competition
- Criteria to be used in the evaluation of ability
- Priority order to be given to these criteria
- In the case of competition on ability and price and combined marking arrangements, an indication should be provided of the minimum weighting for ability

Tenders should receive sufficient time to prepare the proposals. Four to eight weeks are usually sufficient depending on the complexity of the project. The client or its procurers should allot him/herself enough time to evaluate the proposals.

Once the winning tenderer confirms acceptance of the assignment as described in the contract, other tenderers need to be informed that they were unsuccessful, indicating:

- The successful tenderer
- Briefly the reasons why that tenderer was the most successful
- List of all unsuccessful tenderers
- The fee bids received

5 SUBCONTRACTORS

Many construction works use subcontractors. The subcontractors may be nominated by the client or may be nominated by the contractor. The subcontractors may already be involved in the design stage, before selection of the contractor. There are different kinds of subcontractors:

1. Technology specific subcontractors
2. Labour-only subcontractors

The subcontractors may be large, medium and often small firms. The firms may have registered themselves or may be a part of the informal economy. Fact is that subcontractors are very attractive to contractors. It gives them the opportunity to respond quickly to demand. Subcontractors are often seen as a flexible workforce. Furthermore it is an opportunity to transfer risks along the procurement path. Contractors who works with a large amount of subcontractors, become coordinators and conduits for specialist's money.

However subcontractors also pose risks to the contractors. A delay in delivery of a subcontractor affects the planning of the contractor and the other subcontractors. The other subcontractors may submit claims to the contractors. The works of the subcontractors may be so specialised that the procurement of these works may take more time than the rest of the construction activities together. Often it is necessary to order these subcontractors already during the design stage. If the subcontractor is appointed too late, it is likely that the work will be delivered late. While preparing the technical proposal the contractor should assess the timeframe of the subcontractor's inputs. It should also assess if the different designs can be integrated. Wrong dimensions may result in enormous delays.

Many small contractors prefer to operate as subcontractors. It enables them to compete on some basis other than costs. They usually develop strong and stable business relationships with regular clients. However because many contractors pass risk down the line of procurement, the life of the subcontractors is not happiness and sunshine alone.

Payments

As clients do not always pay promptly and the supervisors do not always certify fairly, the payments to the contractor may be delayed. On his turn the contractor may delay the payments to the subcontractors. The contractor's cash flow may be insufficient and the contractor has the option to borrow money from the bank or delay their payments to their suppliers and subcontractors. The contracts between the contractor and subcontractor may even include "pay when paid" clauses. Even when such a clause is not included, many contractors practise it. Although the subcontractors have the right to legal recourse, many will refrain from it. Partly because they depend on work from the contractor and partly

because they have not registered themselves and partly because they do not have faith in the legal system.

There are often disputes over the measurement and valuation of subcontractors work, particularly where an item has not been specified in the bill of quantities. Contractors are reluctant to pay subcontractors before agreeing on a price with their client. Variations are often not valued until long after their issue and therefore not paid immediately.

Protection of work

Under some contracts, subcontractors are responsible for the protection of their work from damages "however caused". This can apply irrespective whether the subcontractor is still on site. This level of risk is unfair to the subcontractor, difficult to price and expensive if not impossible to control.

6 GOVERNMENT PROCUREMENT POLICY

Introduction

Many governments from low and middle-income countries apply an import protection policy with regard their own procurements. Their arguments relate to savings of foreign exchange and domestic employment creation. They therefore procure only from domestic suppliers. This strategy allows governments to stabilise the construction industry to some extent through increasing their spending in years of crisis and reduce their spending during periods with high economic growth. Unfortunately, most governments only apply this stabilising strategy on paper, but do not practise it.

Some countries still work with state enterprises to fill the demands from government, but more and more countries realise that this modality is less productive.

In contrast many advanced economies apply an open door policy with regard to government procurement. In most countries foreign competition lowers the costs of government procurement. Domestic contractors tend to lower their bids when they face foreign competitors. Government interventions to ban or minimize foreign competition almost always result in higher procurement costs.

A few middle-income countries also moved towards an open-door policy. One of their most important arguments that it allows their construction industry to participate in tenders of foreign governments. These countries have often a comparative advantage in fields like construction and defence.

Cost overruns

One of the major difficulties with establishing a policy that accommodates the interest of smaller contractors is the risk of cost overruns. When the winning bid was too low and the contractor has insufficient financial back, both the contractor and the client may face serious problems. The contractor may have to stop the work, go bankrupt leaving the client with an unfinished piece of work. The client either has to bail out the contractor or engage another contractor to finish the construction.

To prevent this problem clients have developed various policies. Contractors may be forced to insure themselves for cost overruns. Alternatively, the client does not select the lowest bidder but the lowest bidder within a range of the clients estimate. That means that the winning bid should be higher than a certain percentage of the clients estimate. In some tender procedures, only contractors with sufficient financial capacity will be short listed or pass the screening tests.

Unfortunately all these strategies discriminate against small domestic contractors. The government may assist the domestic small contractors with bearing some of the risks on relatively small contracts. On larger contracts they could make a detailed analysis

of the financial risks involved for the lowest bidder. The lowest bidder has to provide justification for its statements that it can bear the financial risks of the project.

The government may also facilitate the process of insuring small contractors against various sorts of construction risks.

Corruption

A major problem with government procurement is corruption and rigging of the tender procedures. The construction industry has a bad reputation all over the world with regard to bribing government officials. Contractors form illegal cartels taking turns in winning contracts or sharing profits.

To reduce corruption, governments should establish an audit commission within its legislative branch. It should punish involved government officials and firms with severe financial and criminal penalties. In addition it should ban involved firms from bidding on government contract for several years. The government also have to protect whistle blowers. And finally the government may wish to maintain a state owned contractor that will be engaged when it feels that the prices are too high.

APPENDIX 1: OUTPUT-BASED AGREEMENTS IN SERVICE DELIVERY

- Output based agreements** Modern bureaucracies have developed contracting arrangements with regard to delivery of public services and goods. In the United Kingdom most service providers are private entities. In contrast to the Netherlands, where most service providers are public. But, in both countries the service providers have performance agreements with their respective client (ministry, department, province or municipality). In these agreements the service provider agrees to provide certain services against a certain fee to all who meet certain criteria. These agreements are so-called output-based agreements (OBA).
- Long-term agreements** The output-based agreements stipulate the responsibilities of the client, the service provider and the recipients of the services. The specifications typically describe the services in terms of quality, availability, the number of recipients, maximum tariffs etc. Clearly these provisions are very crucial, but who is responsible for the creation and maintenance of the assets and how are the costs of the service provision recovered? Most output-based agreements are long-term by nature and may cover periods up to 30 years. It is likely that the population expands and the demands with regards to quality and availability changes over such long periods. For example the size of the city Gedaref in Sudan tripled during the period between 1960 and 1990. The agreement should include provisions that accommodate such drastic changes in delivery. The client should be able to direct future investments of the service provider to increase the market share in terms of development goals' achievement. For example, revitalisation of neighbourhoods and creating new suburbs require various infrastructures. Roads, water supply, sanitation, solid waste collection, electricity and telecommunications are all needed to make a neighbourhood attractive to live in. Urban planners, as a representative of the client, therefore should be able to direct the planning of the different autonomous suppliers. Sometimes a very challenging task as the municipality may not be the client of the service providers.
- Asset ownership** It may be possible that the service provider has to arrange everything and has to pay for it. This means that it has to invest and maintain all the assets, like any private company that sells commercial commodities and services. In this case the service provider creates and remains owner of the assets. The role of the client is limited to monitoring. Under Build-Operate-Transfer arrangements, the service provider builds the utility and exploits and maintains it for several years before transferring ownership to the client.
- Leasing assets** On the other end of the scale the service provider leases access to the infrastructure from the client. The client remains responsible that the assets remain in proper condition and receives a usage fee from the service provider. Alternatively the service provider may

Maintenance provisions	<p>also maintain the assets during the lease. Of course under these circumstances it pays a lower lease.</p> <p>Except when ownership, operation and maintenance responsibilities are in one hand, the output-based agreement has to specify the minimum conditions of the assets and the periods when maintenance can be carried out. After all the clients do not benefit when the provision of services has to be stopped due to failures or maintenance activities. Service providers may have to pay penalties or even loose to contract, when they fail to provide the services during certain periods.</p>
Revenue collection	<p>Because it is not possible to quantify each failure in conditions, it is also necessary to quantify the response periods in times of failures and the minimum investments for usage-based maintenance.</p> <p>The service provider may collect its revenue directly from the recipients from user-charges or may sell its services to the clients. In the first situation, the agreement has to specify to maximum rates that can be charged from the recipients. In the latter case the client sells or distributes the public services or goods to the recipients.</p>
Open books	<p>It is also possible that the client supplements the revenues generated from user-charges with subsidies. In this specific case the client wants to have an open book policy, which gives it access to the financial accounts of the service provider, to assess the effectiveness of the collection of service charges and cost control measures. After all clients do not unnecessarily impair financial burdens from poor service providers in addition to their cost control concerns.</p> <p>This set-up requires that the service provider is allowed to borrow and save. Many public service providers are denied this by the treasury. Still it is possible to develop output-based agreements. In the Netherlands, the public agency responsible for road access through the national highways (Rijkswaterstaat) has a long-term agreement with the treasury that commit the service provider to maintain the road network and the treasury to finance it. Because of this agreement, Rijkswaterstaat has to justify its maintenance plans and therefore uses a standardised maintenance control system (lokaal beheerplan). This maintenance control system specifies the minimum condition of the various road elements and the way the maintenance plan has to be developed. The long-term agreement does not specify the financial contribution of the treasury, except that it should be sufficient to carry out the maintenance activities. The financial amount is fixed in annual contracts, which describes the maintenance works on each specific road link and their budgets. Because of its large road network, the annual fund requests to the treasury are all in the same range, but the actual fund distribution is based on long term maintenance (read cash) requirements on each of the road links. The treasury receives all the revenues, related to road usage.</p>
Specifying service delivery	<p>It is recommendable to keep the specification with regard to service delivery as simple as possible. Often the service delivery is described in a number of beneficiaries or recipients that receives or has access to a certain service. The requirements with regard to the service are described in terms of quality, availability and tariff.</p>

Output versus outcome	<p>The specification about the service delivery is preferably output-based. This means that the service provider has full control over the realisation of the service delivery. Many make the mistake to include elements of outcome-based specifications. Elements which are not under control of the service provider. For example, road safety is an important issue to each road agency. However even if the road design is perfect, many accidents occur. Accidents are not solely caused by the road lay-out, but often by behaviour of the road users. Many road safety projects are “try and error” attempts to reduce unwanted movements from road users.</p>
Respecting other acts	<p>Like any activity the service provision should obey other existing and future laws, like the labour protection, environmental protection and spatial planning related acts. The provisions in these acts could limit the options of specifying the service delivery requirements. For example, it was not possible to prepare specifications about congestion free highway access in the Netherlands. The interventions required to meet this specification would be in conflict with the Dutch environment protection act and the spatial planning act.</p>
Outcome-based agreements	<p>For these reasons, Rijkswaterstaat and the Dutch treasury also have an outcome-based agreement. Like the maintenance agreement it is composed of a long-term agreement and annual agreements. The long-term agreement is a combined intention declaration, specifying the ideal road conditions with regard to congestion and road safety. It does not specify if the treasury will finance interventions to realise these ideal road conditions. The annual agreements specify the road improvement projects that the cabinet and treasury agree to finance.</p> <p>Like any contract, the agreement has to include penalty clauses describing the consequences when the service provider does not meet the specifications with regard to service delivery. The height of the penalty has to relate to the offence. There are various offences like:</p> <ul style="list-style-type: none"> • Number of recipients deprived of service • Temporary out of service (Number of days) • Service does not meet quality standards • Combination of the above <p>The penalty clauses should specify the offences and its penalty. It may be helpful to use multi-criteria analysis to describe the offences and penalties . Depending on the payment structure, the penalty may relate to the tariff or the subsidy.</p> <p>For more information about Output-Based Agreements, check out the following website:</p> <p>http://www.gpoba.org/index.asp</p>

