

Roads Pavement Forum 2011

How to Overcome Hurdles Preventing Expenditure of Available Road Budgets

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**40 YEARS
1969 - 2009**

Soderlund and Schutte

Current public sector realities



27 October 2010

South Africa's spending on all public infrastructure – including power, transport, water, health and education – is forecast to be R811,2-billion between now and March 31, 2014.....

But in releasing the latest Medium-Term Budget Policy Statement (MTBPS), Finance Minister Pravin Gordhan acknowledged that **priority had to be given to addressing government's capacity to plan and implement infrastructure projects**, which were prone to delays and cancellations.

100 000 full time jobs could have been created

During the 2009/10 fiscal period alone, some **R12,4-billion budgeted for capital projects was recorded as unspent**, excluding underspending by the SoEs.

Current public sector realities



12 November 2010

It was reported once again that *SANRAL **has complained about the service levels provided by member firms*** particularly in regard to the lack of effective cost control on projects

**The cidb Construction Industry
Indicators Summary Results: 2009**



Clients were satisfied with the quality of the completed work at handover on 81% of the projects, and were **neutral or dissatisfied on 19% of the projects** in 2009. Notably, client satisfaction with the quality of work delivered was the lowest in the residential building sector, and **highest in electrical, mechanical and civil works sectors**

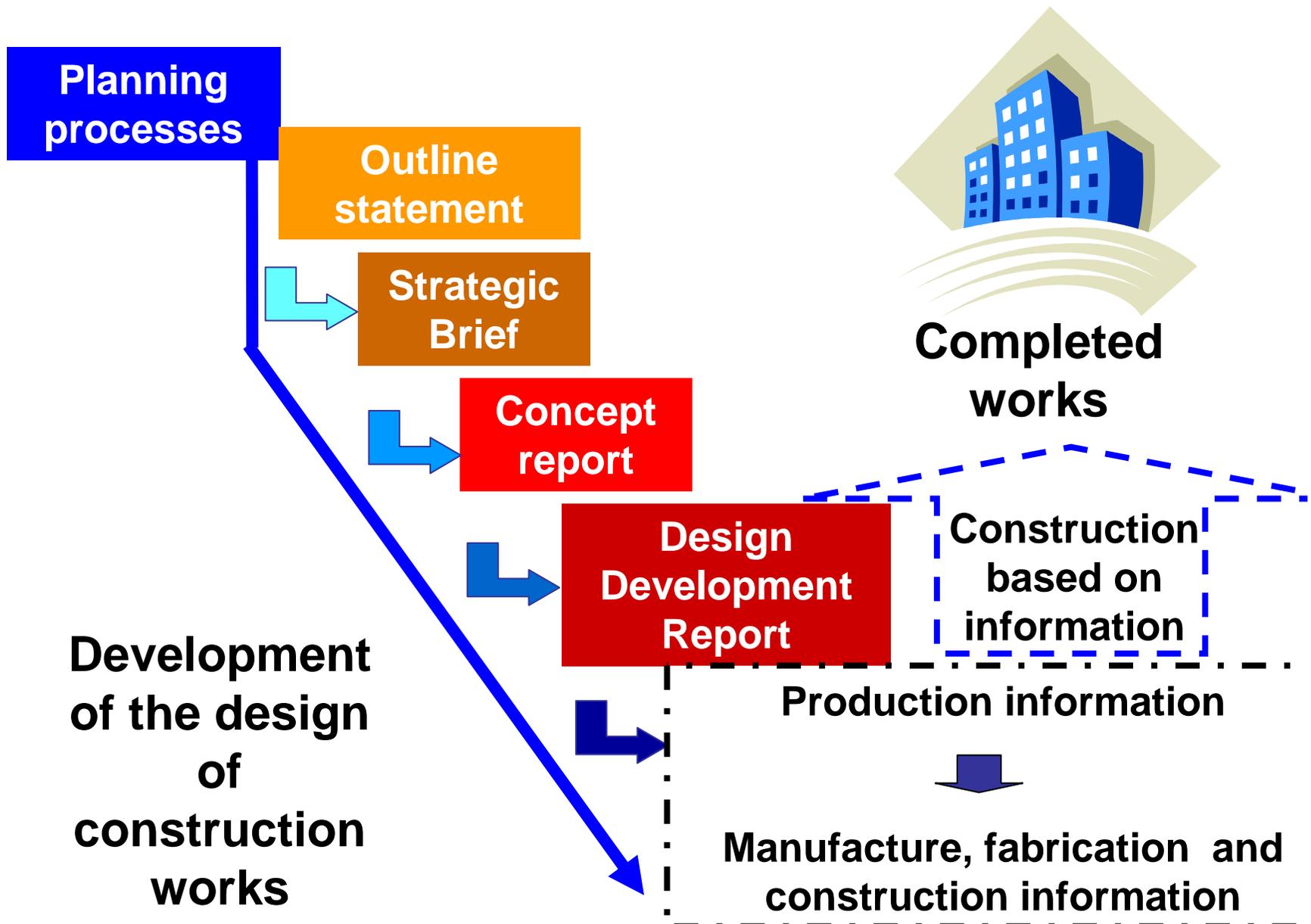
World Bank Reports on Africa

World Bank (Foster, V (2008)) examined infrastructure planning, delivery and operation and maintenance in 24 countries in Sub-Saharan Africa, that together account for 85% of its GDP and population and **found that countries only manage to spend about two thirds of the budget allocated to investment in infrastructure**

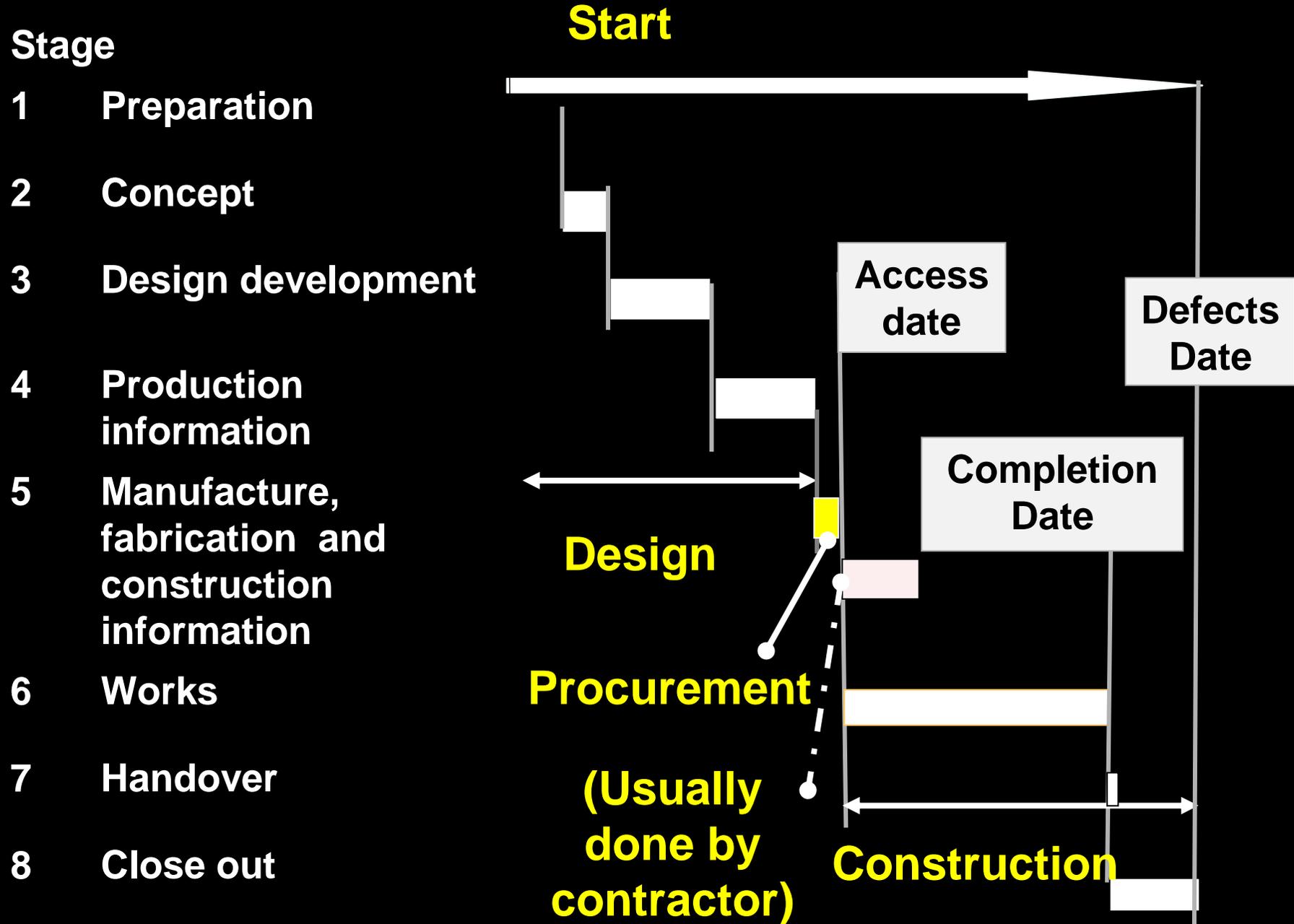
World Bank's African regional strategy (2011) recognises that Africa's competitiveness is *impeded by poor public investment choices, weak budget management, and corrupt or **lethargic procurement practices***

Work flow for construction works

Project Brief is progressively developed from



Traditional approach to construction



Traditional approach to construction

Scope of work for consulting services contract

Fee based on percentage of cost of construction – allows project to be developed as it unfolds

Outline statement

Procure consulting services

Stage 1: Preparation

Stage 2: Concept

Stage 3: Design Development

Stage 4: Production information

Scope of work for construction work contract

Priced contract based on lump sums or bill of quantities

Procure construction works

Traditional approach to construction

Procurement strategy for traditional approach to delivery

- One project one contract (or a group of smaller contracts)
- Discipline specific consultants appointed on a percentage fee basis
- Open tenders are called for when the design is complete
- Contractors are contracted on a bills of quantities basis

No need to consider procurement strategy – a one size fits all approach suffices

Traditional approach to construction

John Smeaton in 1768 during the construction of the Clyde Canal (Scotland) established the **master / servant** between designers and contractors

Sir Joseph Bazalgette's standard form of contract for London's major sewer projects and the embankments on the Thames 1860s was adopted by the Metropolitan Board of Works

Institution of Civil Engineers's standard form of contract published in 1945 based on the 1860 standard form of contract

South African current traditional forms of contract based on ICE form of contract

Are there different ways of delivering projects to improve outcomes?

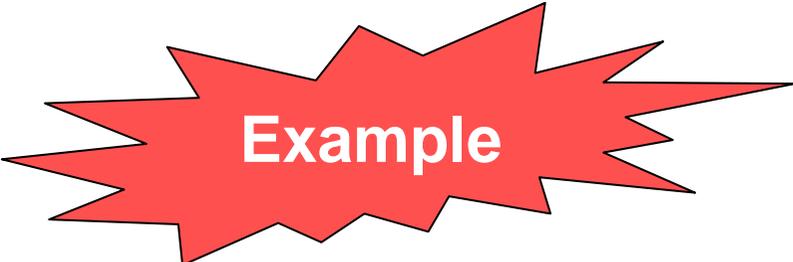
Office of Government Commerce (UK)

Common Minimum Standards for Procurement of Built Environments in the Public Sector (2006)

Procurement strategies and contract types must support the development of **collaborative relationships between the government client and its suppliers and shall facilitate the early appointment of integrated supply teams (each part of which should incorporate an integrated supply chain)**

Guidance states:

Traditional, nonintegrated procurement approaches should not be used unless it can **be clearly shown that they offer best value for money – this means, in practice they will seldom be used**



Example

Distribution of employment over time

Employer	Percentage distribution (%) of engineers and technologist	
	1967	2005
State owned enterprises	12	6
Government including provincial	12	4
Local government	15	10
Consultants	31	51
Industry or business	28	23
Academia	2	6

Migration from public sector to consulting sector



} Stable

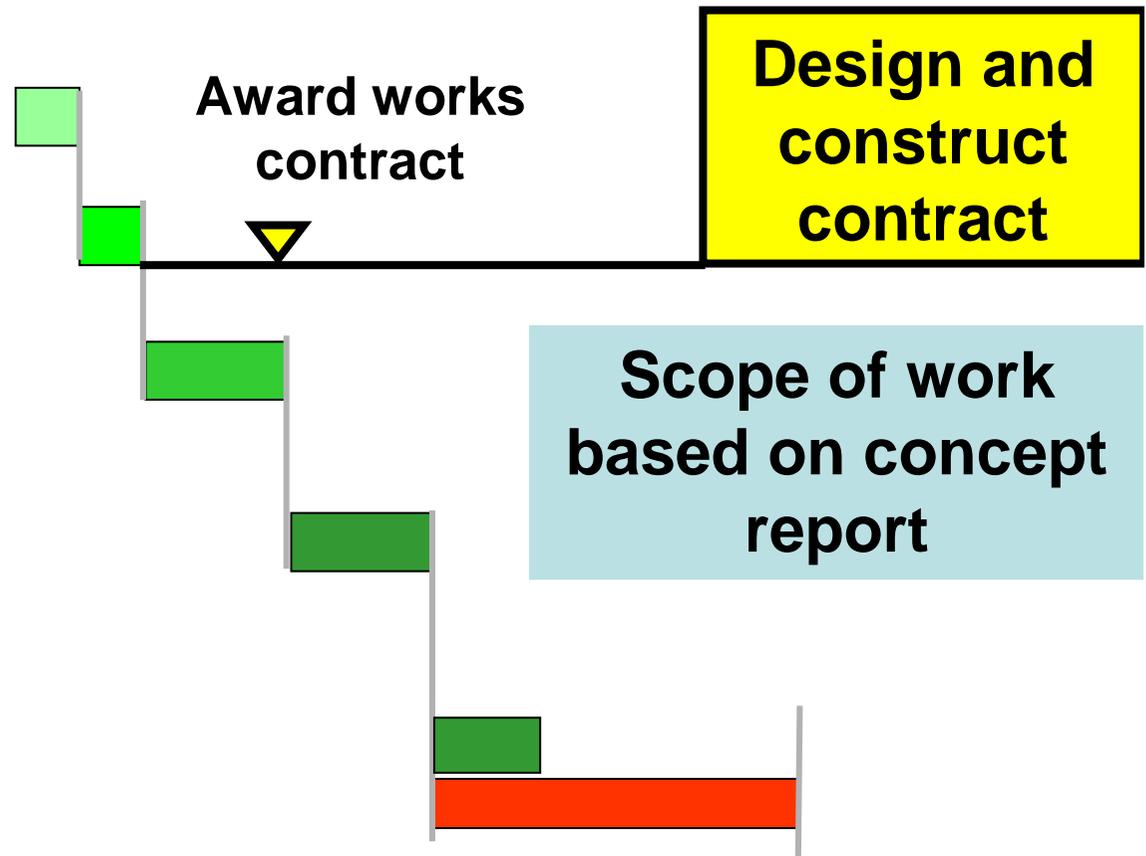
Why has the approach to delivery remained the same?

Alternative allocation of design responsibilities

Design and construct	Contractor designs a project based on a brief provided by the client and constructs it
Develop and construct	Contract based on a scheme design prepared by the client under which a contractor produces drawings and constructs it

Alternative contract strategies

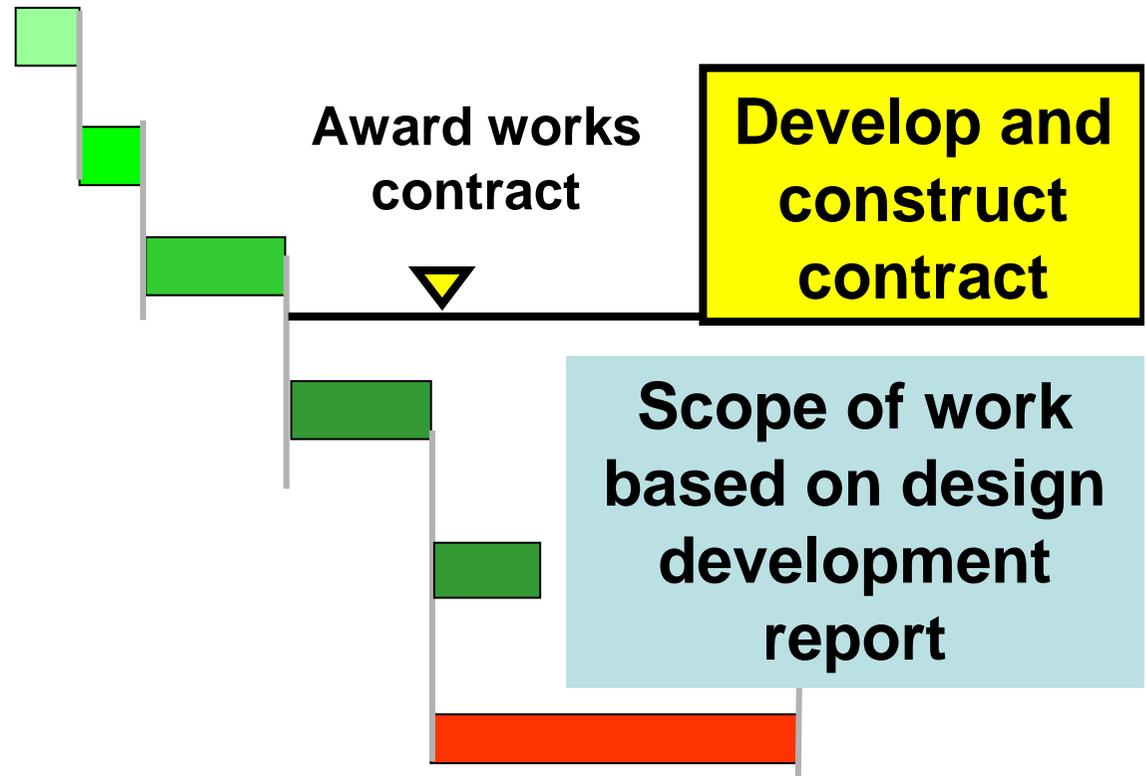
Stage	
1	Preparation
2	Concept
3	Design development
4	Production information
5	Manufacture, fabrication and construction information
6	Works
7	Handover
8	Close out



Note
 Contractor responsible for later design stages
 Consultant reviews contractor's design against project brief

Alternative contract strategies

Stage	
1	Preparation
2	Concept
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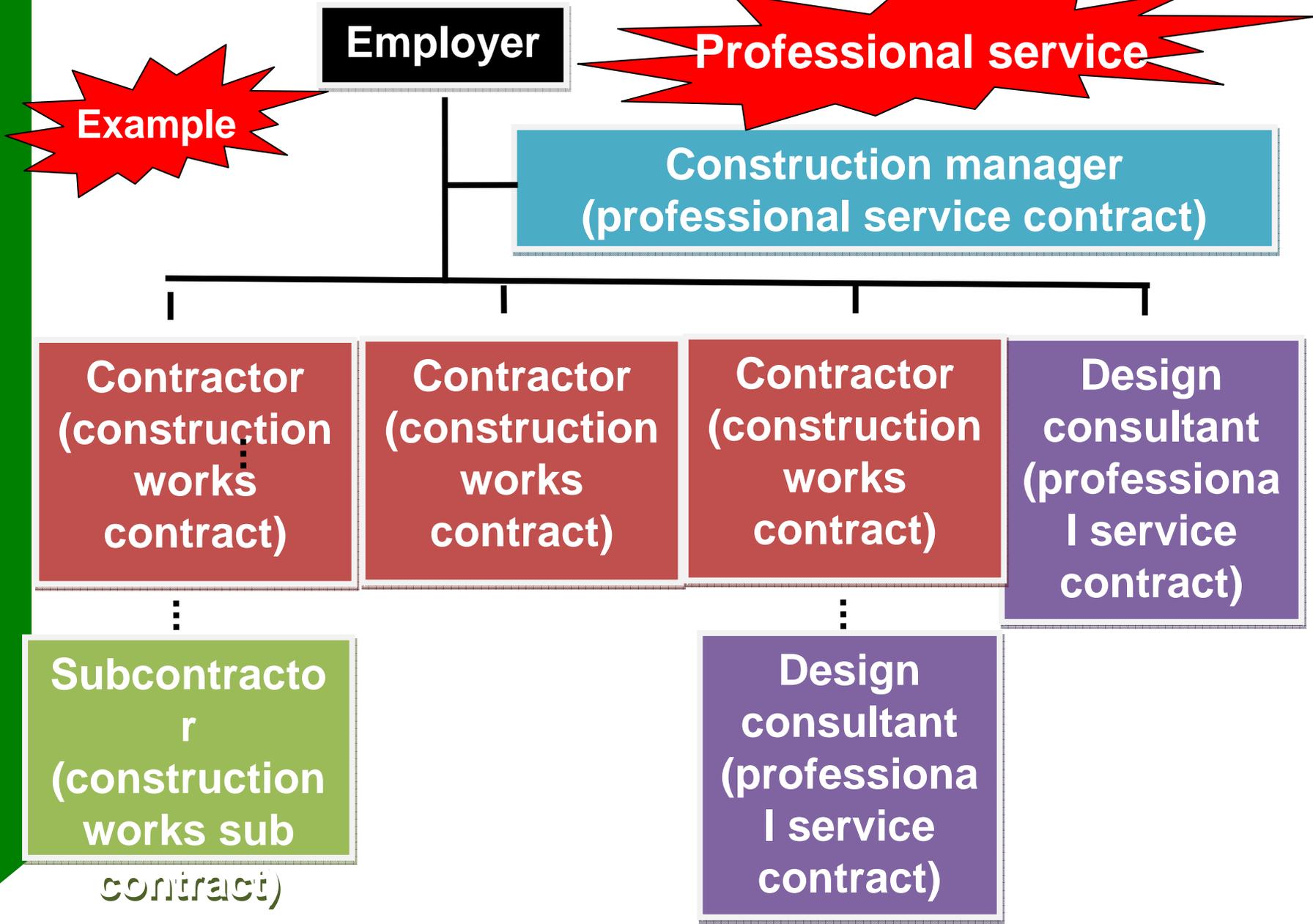


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Alternative allocation of management responsibilities

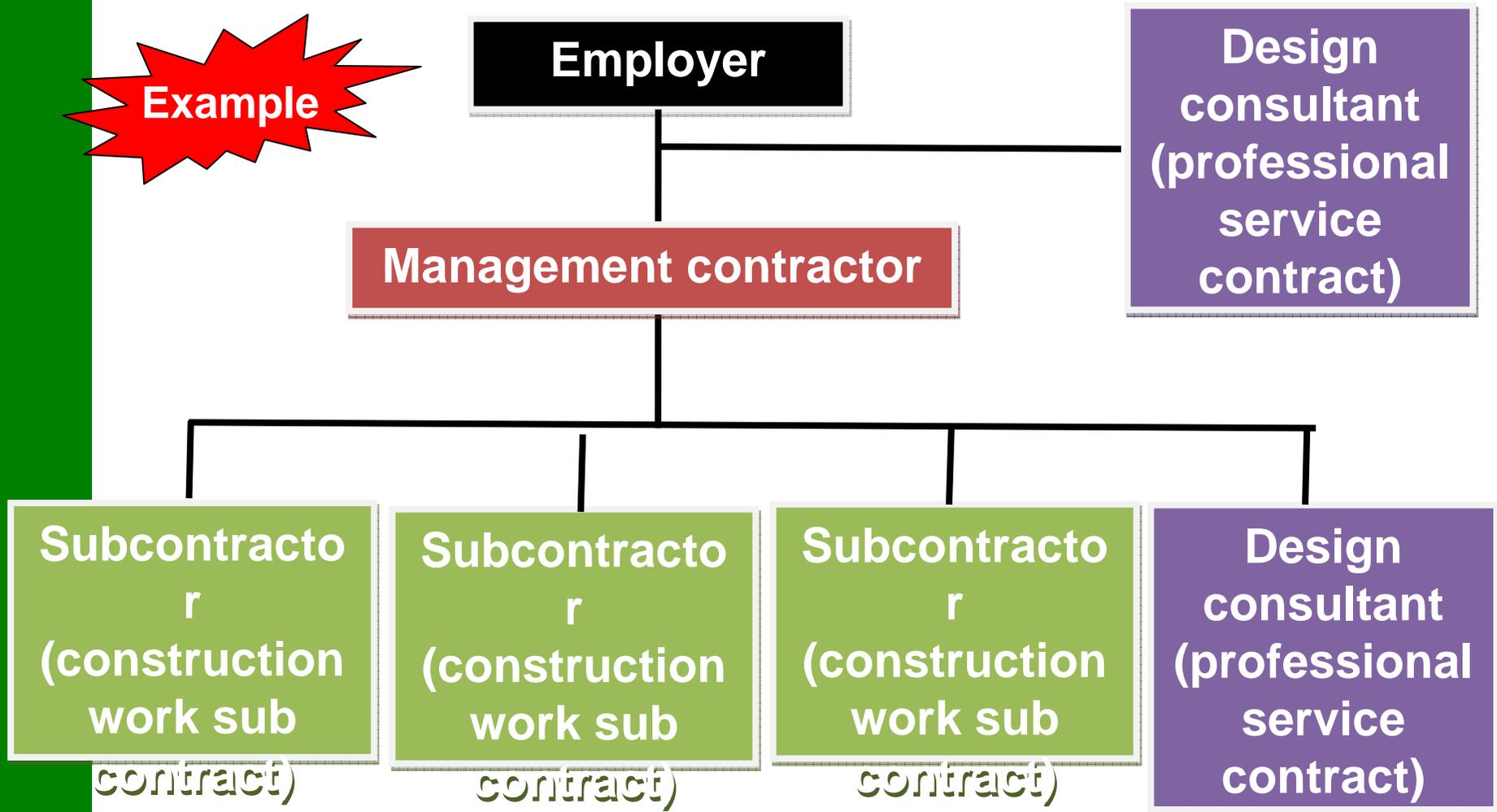
Construction management	Contract under which a third party (professional service provider) is responsible for planning and managing all post-contract activities for contractors appointed by the employer
Management contractor	Contractor is responsible for planning and managing all post-contract activities and for the performance of the whole of the contract

Construction management relationships



Management contractor relationship

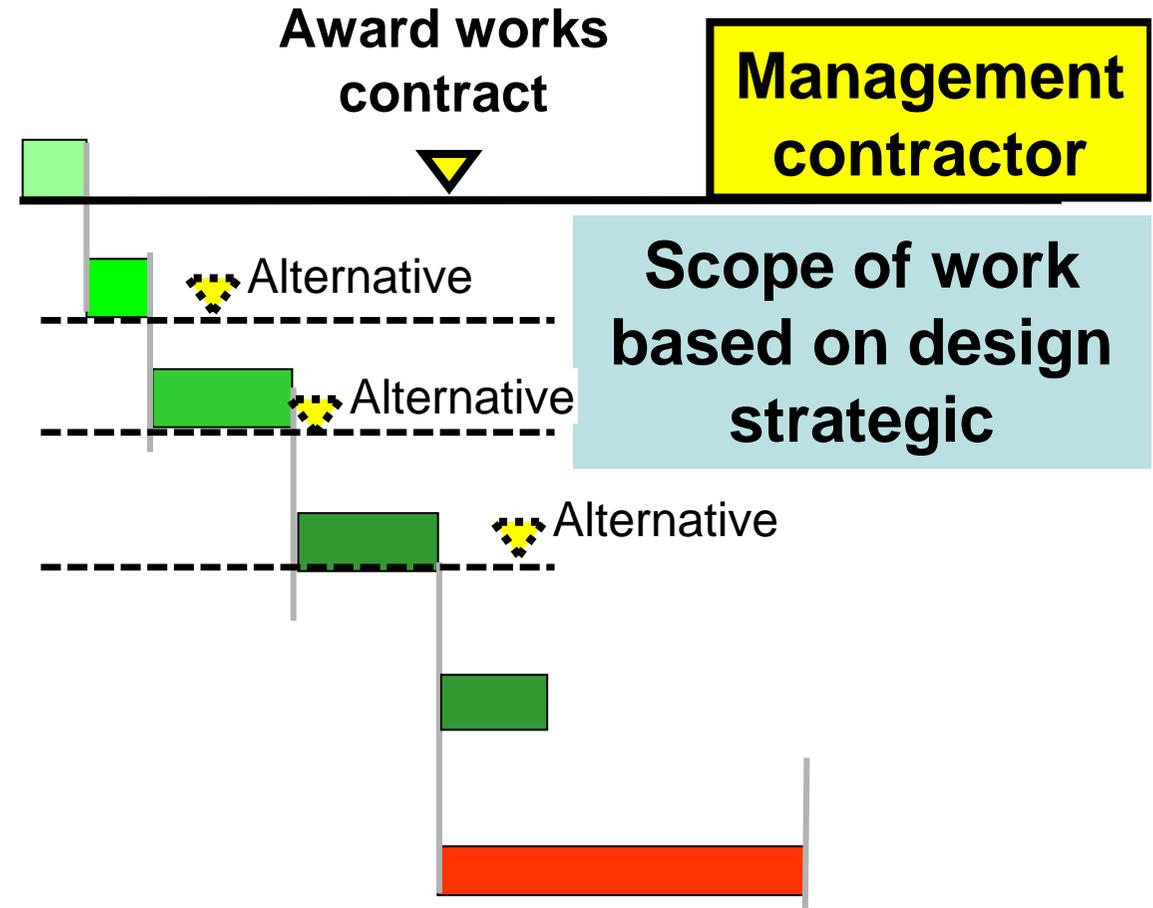
Example



Management contractor subcontracts out the bulk of the work

Alternative contract strategies

Stage	
1	Preparation
2	Concept
3	Design development
4	Production information
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6	Works
7	Handover
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Alternative pricing strategies

Starting point

Tender prices can be built up by considering a number of components including:

- **General items:** items to cover the charges for compliance with contractual obligations
- **Construction (work) content:** price of constructing all the items that are to be constructed or built
- **Overheads:** operating (every day) expenses incurred in the upkeep of the business and its offices that are not directly attributable to individual contracts
- **Risk allowance:** an allowance (contingency) to cover the perceived risk associated with uncertainty
- **Profit**

Bill of quantities

Build up of tender price

General item
or
Construction content –
labour, materials, plant
and equipment
or
Subcontracted work

Overheads

Profit

Risk
allowance

Item No.	Description	Unit of Measure	Quantity	Rate	Total
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Bill of quantities

- is useful only to develop a tender price for the contract
- cannot be used to control costs on site

Activity schedule

Item No.	Programme Reference	Activity description	Price excluding VAT
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General item
or
Construction content –
labour, materials, plant
and equipment
or
Subcontracted work

Overheads

Profit

Risk
allowance

**Build up
of tender
price**

An Activity Schedule is a list of activities which represents the activities expected to be carried out

The Contractor enters lump sum prices against each of these activities (Total = contract sum)

Paid for completed activity

Lump sum

Lump sum	Contractor is paid a lump sum to perform the works (Interim payments which reflect the progress made towards the completion of the works may be made)
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Contractor is :

- at risk for costs associated with completing the contract
- not compensated for any errors or omissions

Price list

Price list / schedule	Contractor is paid the price for each lump sum item in the Price List that has been completed and, where a quantity is stated in the Price List / Schedule, an amount calculated by multiplying the quantity which the contractor has completed by the rate
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Contractor is only paid amounts in Price List for priced work

What about other pricing strategies?

Price based:

- bill of quantities
- activity schedule
- lump sum
- price list

Cost based:

- cost reimbursable
- target cost

Cost reimbursable contract

Fee includes profit and overheads

Fee

Wages and salaries

+

Materials at open market rates

+

Site overhead percentage

Fee includes profit and overheads

Fee

Equipment at agreed rates, market related rates or percentage up or down on a hire list

Subcontract costs

Cost reimbursable contract

Fee includes profit and company overheads

Wages and salaries

Site overhead percentage

+

Question: How is cost controlled?

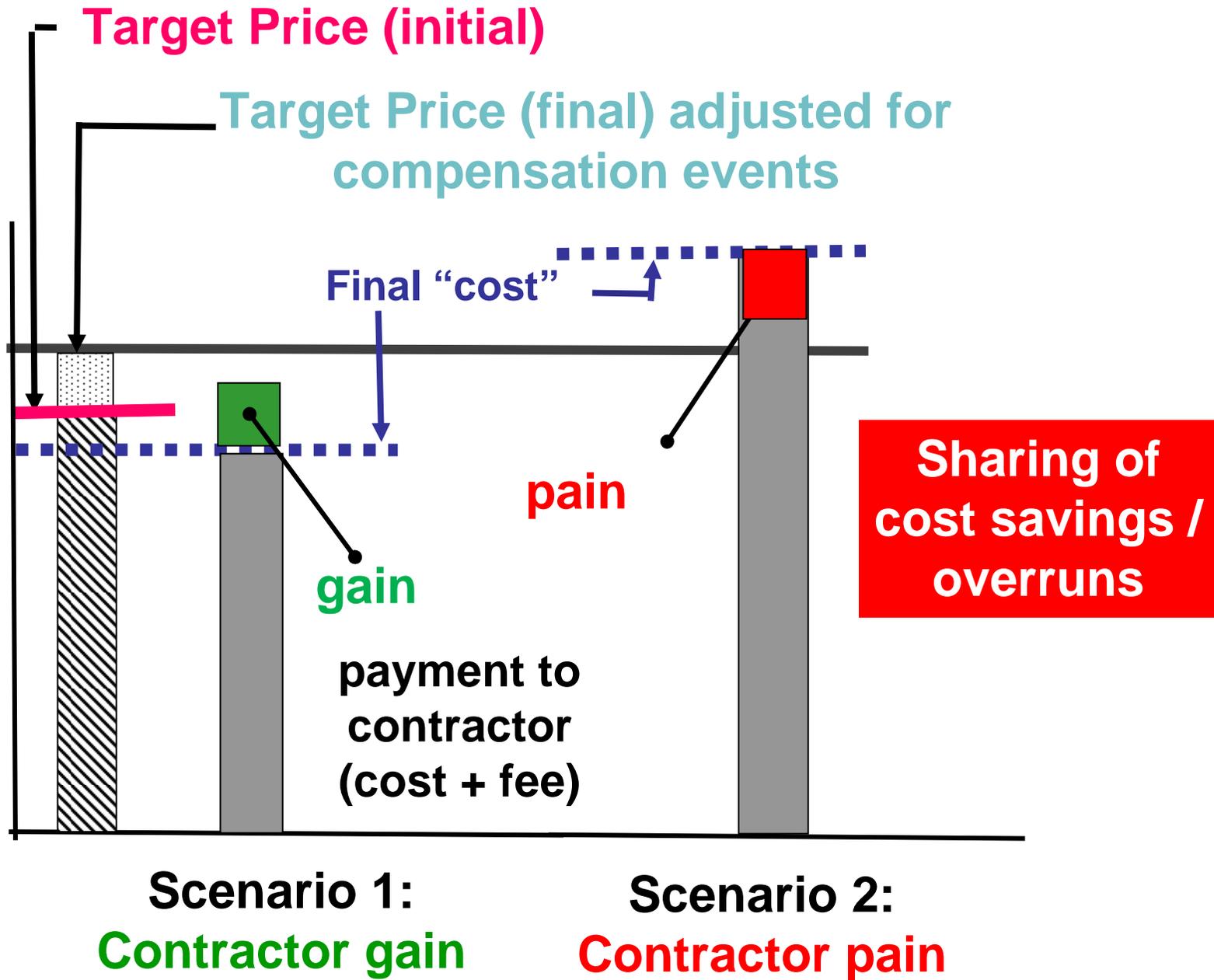
Fee includes profit and superintendence

Equipment at agreed rates, market related rates or percentage up or down on a hire list

Fee

Subcontract costs

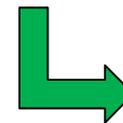
Target cost contract



Target contract with an activity schedule

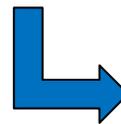
The three corner stones of **Earned Value Management** are:

Planned Value – *the authorized budget assigned to the scheduled work to be accomplished*



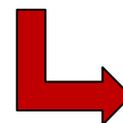
Values in activity schedule

Earned Value – *the value of the work performed expressed in terms of the budget assigned to that work*



Completed and partially completed activities at a given point in time

Actual Cost – *total costs actually incurred and recorded in accomplishing work performed during a given time period*



Actual cost

Target price contracts

Procurement of contractors

Option 1 (design is not sufficiently developed)

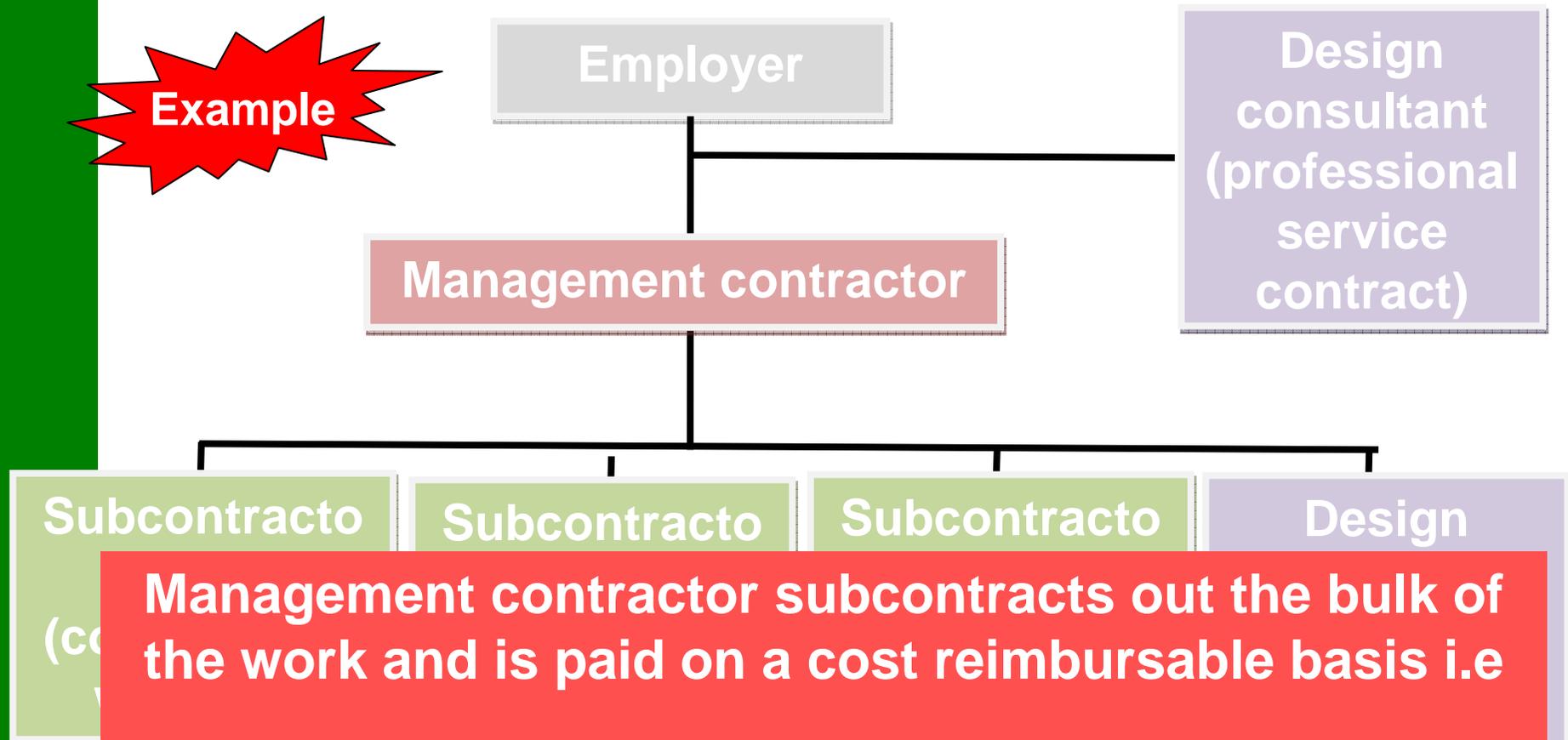
- Tenderers tender cost parameters
- Target price negotiated when sufficient information available to price the works

Option 2 (design is sufficiently developed to price)

- Tenderers tender cost parameters
- Assumptions are made about any uncertainties so that the tenderers can price the works (adjust target if assumptions turn out to be incorrect e.g. quantum of reinforcement)
- Tenderer tenders a target price

Management contractor relationship

Example

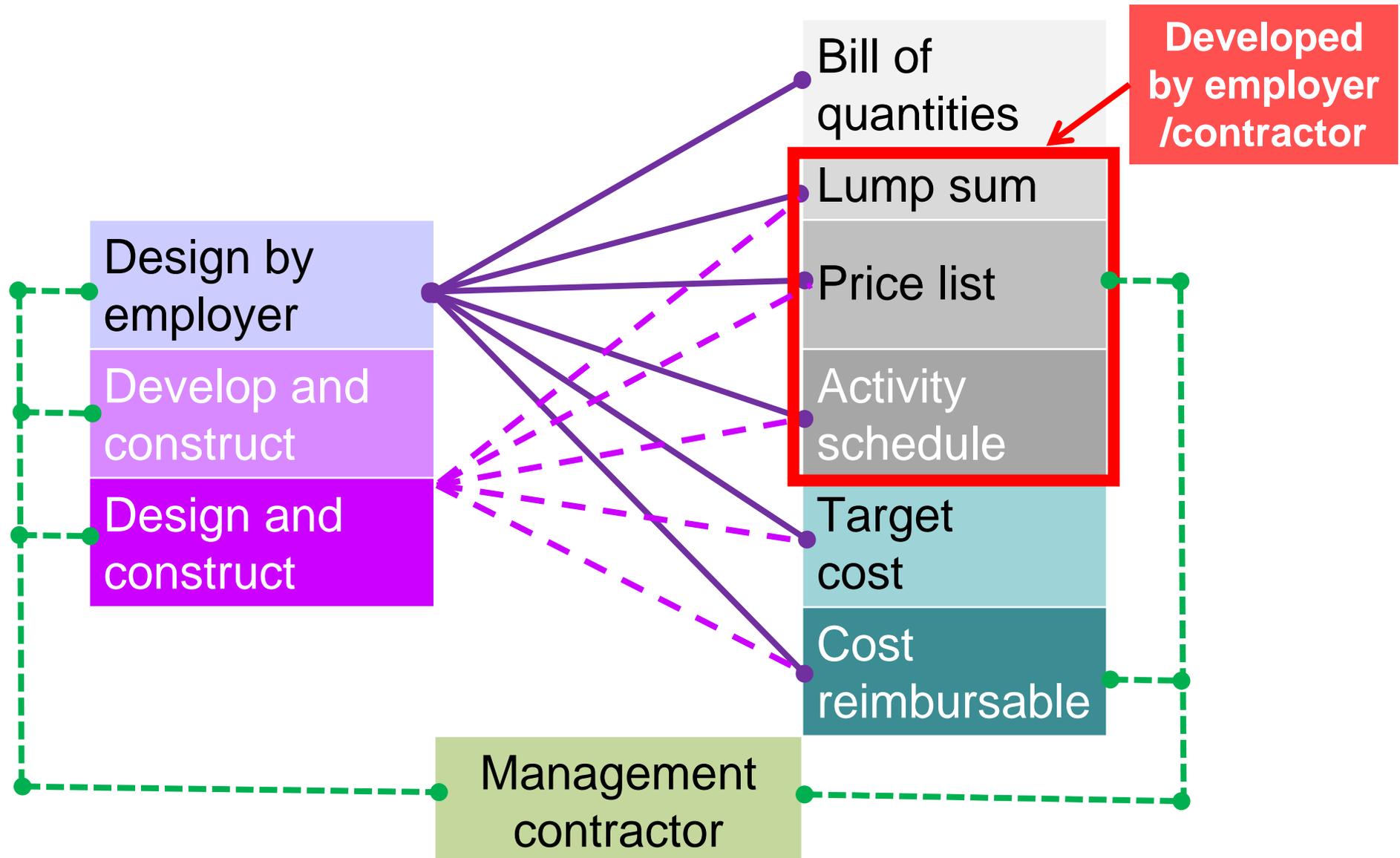


Management contractor subcontracts out the bulk of the work and is paid on a cost reimbursable basis i.e

subcontract amount plus a fee + prices for work done by the contractor himself

This allows cost to be controlled

Linking pricing & contracting strategies



Critical question – who manages the design and when is a contractor appointed

Lean construction

To provide higher value and less waste the fragmentation in design needs to be addressed, preferably before 25% of the design is complete

Target cost contracts can enable this to happen even where a design by employer approach is adopted

This allows a specialist in construction to be appointed at the same time as the design team

Such a contractor may or may not be responsible for managing the design team

Consideration	NEC3	JBCC	GCC	FIDIC
Contracting strategy				
Design by employer	Yes	Yes	Yes	Red
Management contract		No	No	Silver
Develop and construct			Yes	Yellow & Silver
Design and build				
Pricing strategy				
		Lump sum & breakdown		
Activity schedule	Yes	No	No	No
Lump sum		Yes	Yes	Yellow & Silver
Bill of quantities		Yes	Yes	Red
Cost reimbursable		No	No	No
Target cost		No	No	No

What is a framework agreement?

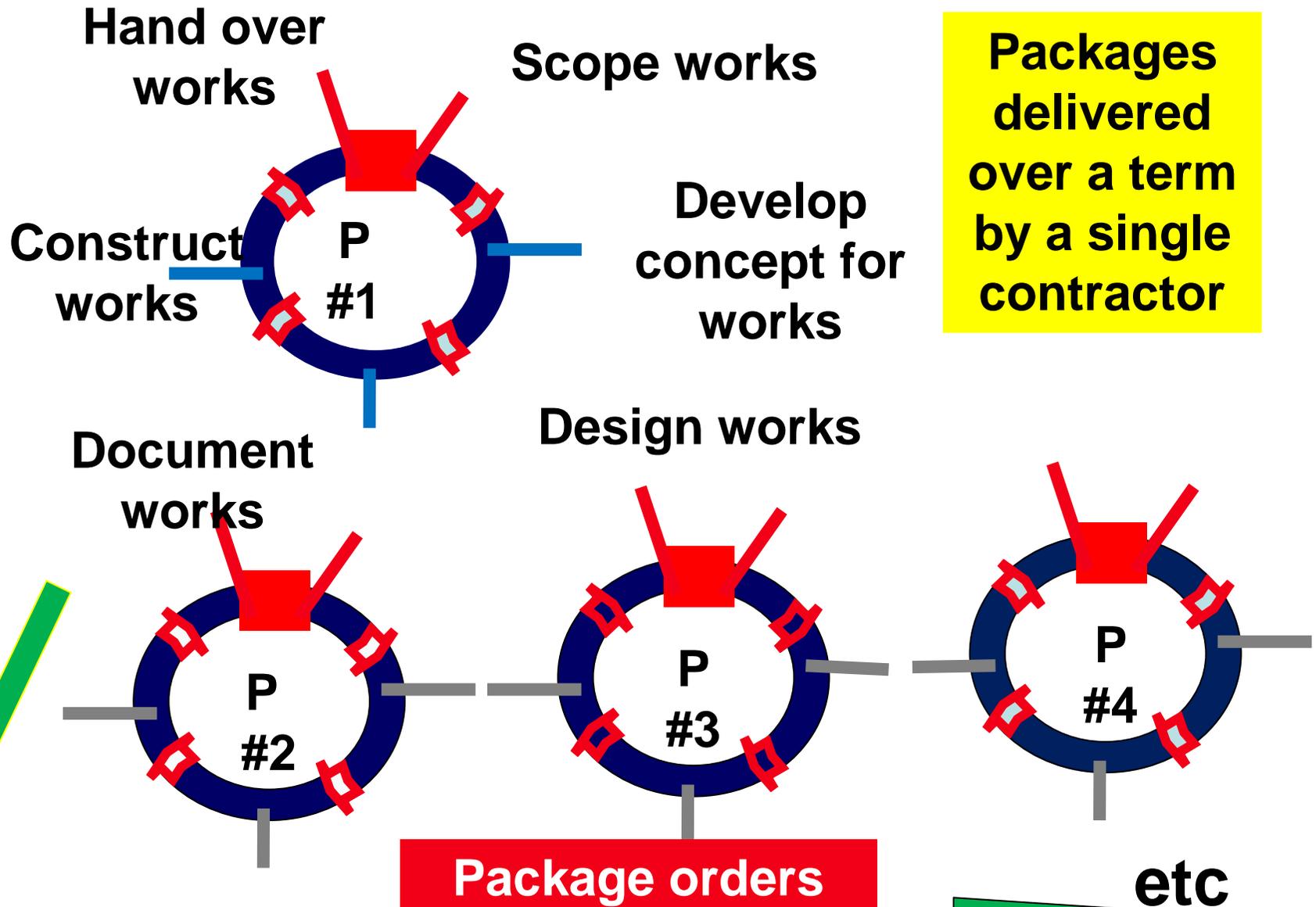
*ISO 10845-1, Construction procurement – Part 1:
Processes, methods and procedures*

A framework agreement is an agreement between an organization and one or more contractors, the purpose of which is to establish the terms governing contracts to be awarded during a given period, in particular with regard to **price** and, where appropriate, the quantity envisaged

Framework agreements allow the employer to **procure construction services** to provide **work packages** (“**call off**”) on an as-instructed basis over a set term without necessarily committing to any quantum of work

Packages in a framework contract

C
o
n
c
e
p
t



Packages delivered over a term by a single contractor

Package orders

etc

Procuring a service over a period of time

University of the Witwatersrand



Package #1

**Start January
2009**

***Chamber of Mines –
fourth quadrant (R70 m)***



Package #3

April 2010

Wits Art Museum (R68m)



Package #2

**Start
November
2009**



***Undergraduate Science
Centre– phase 1 (R178 m)***



Package #4

**Start
October 2010**

***Refurbishment of Chamber
of Mines – (R45m)***

**Same contractor but
different professional teams**

Water project

eThekweni Water and Sanitation (Durban) : Pilot project

- identified a R750 million project for the replacement of 2 500km of AC water pipes over a period of 3 years
- appointed one programme manager + 4 design consultants + 4 contractors (framework agreements)

Time frames

Feb 2007 - concept introduced and workshopped with officials, consultants and contractors

Mar 2007 - calls for expressions of interest

May 2007 - shortlisted respondents invited to tender

May 2007 - tenders closed

June 2007 - tenders evaluated and awarded

1 July 2007 - work starts (new financial year)

Example

Winner of the 2009 KAMOSO award for Best Construction Project in the Infrastructure Category for excellence in the implementation of Expanded Public Works (EPWP)

Productivity: 80 km of water mains replaced each month.

Socio economic:

- ± 3800 temporary unemployed workers employed to excavate trenches and are rotated every 4 months to allow others to financially benefit
- Temporary workers paid 21% of total project expenditure.
- 16 subcontractors (or “co-contractors”) are being developed to increase their share of the construction work from 10% to 20% over time (should double their turnover over time)
- A full time mentor has been engaged to assist the “co-contractors” in the establishing of business systems

Staff demands on client: one staff member

Culture change

From	To
Master-servant relationship of adversity	Collaboration towards shared goals
Fragmentation of design and construction	Integration of design and construction
Allowing risks to take their course or extreme and inappropriate risk avoidance or risk transfer	Active, collaborative risk management and mitigation
Short-term " <i>hit-and-run</i> " relationships focused on one-sided gain	Long-term relationships focused on maximising efficiency and shared value
Constructability and cost model determined by design team and cost consultant <u>only</u>	Constructability and cost model developed with contractor's insights
"Pay as you go" delivery culture	Discipline of continuous budget control

Contracting arrangements

Priced contract	Bills of quantities	Form of contract -FIDC -GCC 2010 -JBCC -NEC3 (Depends on options selected)
	Activity schedule	
Cost based	Cost reimbursable	
	Target cost	
Design and construct		
Develop and Construct		
Design by Employer		
Management Contract		

Its all about understanding the options and making the appropriate choices

Why not for roads?



40 YEARS
1969 - 2009

Soderlund and Schutte

Questions?