

***Appendix A:***

***Outline of Construction Management Functions /Roles for  
each phase of the project (source: Construction  
Management Association of America)***

*Appendix B:*

*Questionnaire*

# **CONSTRUCTION MANAGEMENT**

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## **AS A BUILDING PROCUREMENT SYSTEM IN THE SOUTH AFRICAN CONSTRUCTION INDUSTRY**

**QUESTIONNAIRE**

**FEBRUARY 2003**

## INTRODUCTION

This questionnaire is aimed at determining the effectiveness and extent to which construction management (as a building procurement system) is used in the South African construction industry.

Kindly complete the questionnaire carefully and send the completed questionnaire to :

Attention: Siyabonga Mbanjwa  
Fax: (012) 313 4307 or  
E-Mail: [siyabonga.mbanjwa@resbank.co.za](mailto:siyabonga.mbanjwa@resbank.co.za)

It would be appreciated if completed questionnaires could be received by 12h00 on Monday, 17 February 2003.

**Please feel free to disseminate the questionnaire to your colleagues that are involved in property development, construction management and/or project management.**

## COMPLETION OF THE QUESTIONNAIRE

For purposes of this questionnaire, please take note of the following abbreviations and definitions:

- **Construction Management (CM):**

An alternative building procurement system that is a fusion of old established construction practices with current technological advances and latest management methods into one completely integrated working system to control time, cost and quality. It unites a three party team of a client, the design team and professional construction manager, who is responsible for the co-ordination of various trade contractors, with a common goal to best serve the needs of the client.

- **Building Procurement System (BPS):**

This is a process by which a building is designed and constructed to suit a specific client or buyer

**This questionnaire comprises of two sections:**

- Section A** must be completed by all respondents.
- Section B** is to be completed by clients / developers and built environment professionals that have been involved in projects using construction management as a building procurement system.

**Thank You**

**SECTION A: (To be completed by all respondents)**

**1. BIOGRAPHICAL DETAILS:**

4.5 What is your occupation, relative to the construction industry ?

- Practising Built Environment Professional
- Client / Developer
- Other, please specify: \_\_\_\_\_

1.2 What is your professional background ?

- Construction Manager
- Construction Project Manager
- Architect
- Quantity Surveyor
- Civil and/or Structural Engineer
- Electrical and/or Mechanical Engineer
- Other, please specify: \_\_\_\_\_

1.3 If practising as a construction manager and/or construction project manager, have you applied for registration with the SA Council for Construction and Project Management Professions (SACCPMP) ?

- Yes       No       Not Applicable (N/A)

1.4 Which province are you based in ?

- Gauteng       KwaZulu Natal
- Other: Please specify: .....

**2. CLIENT OBJECTIVES, PROJECT SUCCESS AND BUILDING PROCUREMENT SYSTEMS**

2.1 Kindly indicate your level of knowledge of the following building procurement systems on a scale of 1 (no knowledge at all) to 5 (excellent knowledge):

Traditional System (with or without project management)	
Management Contracting	
Construction Management	
Design & Build (including turnkey)	
Design and Manage (including Build, Operate & Transfer etc)	

2.2 Do you always consider all possible building procurement systems when you start a new construction project ?

Yes       No

2.3 Do you believe that there is a relationship between building procurement selection and the attainment of client objectives (project success) ?

Yes       No

**3. CONSTRUCTION MANAGEMENT:**

3.1 Have you recently (past 10 years) been involved in a South African construction project whereby construction management was used as a building procurement system ?

Yes       No

3.2 If you have not used construction management before, kindly indicate your reasons for not utilising it:

Insufficient knowledge of the system	
Suitable project has not come up yet	
Client did not prefer to use CM	
Principal agent did not prefer to use CM	
Other project team members did not prefer the use of CM	

Other: Please specify:

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3.3 In your opinion, which of the following built environment professionals are best suited to offer construction management services (please tick applicable one/s) ?

- Construction Manager
- Construction Project Manager
- Architect
- Quantity Surveyor
- Civil and/or Structural Engineer
- Electrical and/or Mechanical Engineer
- Other, please specify: \_\_\_\_\_

3.4 In your opinion, which of the following organisations are best suited to offer construction management services (please tick applicable one/s)?

- Building and/or Civil Contractors
- Professional / Specialist Project Management Firms
- Architectural Firms
- Quantity Surveyor Firms
- Civil and/or Structural Engineer Firms
- Electrical and/or Mechanical Engineering Firms
- Other, please specify: \_\_\_\_\_

***If your answer to 3.1 was yes, please proceed to answer section B. If your answer was no, then you may proceed to the end of the questionnaire. Thank you for participating in the survey.***



**SECTION B: (To be completed by respondents with construction management experience in SA only)**

**4. FORMS OF CONSTRUCTION MANAGEMENT**

4.1 Which form of construction management have you used on your projects?

Pure CM (“not at Risk”) Sure
  CM “at Risk”
  Not

4.2 Which variant/s of the above mentioned forms of construction management are you familiar with and / or have you used previously ? *(please indicate yes with Y and no with N, in both columns)*

<b>Variant of Construction Management</b>	<b>Familiar With</b>	<b>Used Previously</b>
Pure Agency CM with general contracting and Hourly CM Fee		
Pure Agency CM with General Contracting and a Lump Sum CM Fee		
Pure Agency CM with Phased Construction <i>(construction by various contractors, at element level, &amp; tendering starts before design ends)</i>		
Pure Agency - Multi Prime <i>(CM co-ordinates various contractors, at trade level, that contract directly with the client).</i>		
Pure Agency - Multi Prime with a “Soft” Cost Guarantee		
Pure Agency - Multi Prime, CM guarantees Price and Holds Trade Contracts <i>(CM contracts directly with trade contractors)</i>		
The CM Bonds the Project <i>(guarantees full performance of the project)</i>		

**5. ROLE PLAYERS IN CONSTRUCTION MANAGEMENT**

5.1 Which member of the professional team was appointed as the client's principal agent, in most instances on your CM projects ?

- Construction Manager
- Construction Project Manager
- Architect
- Other: Please specify: \_\_\_\_\_

5.2 What was the client's level of involvement on the CM project/s ?

- High
- Average
- Low

5.3 What was the level of inter-organisational conflict on your CM projects ?

- High
- Average
- Low

**6. AN ARGUMENT FOR AND AGAINST CONSTRUCTION MANAGEMENT**

6.1 In your opinion, which of the following are the benefits of CM? Please indicate by ranking each benefit from 1 (most important) to 7 (least important)

1. Cost Reduction	
2. Design Flexibility	
3. Full Control of the Construction Process	
4. Fast Tracking (Quicker Delivery)	
5. Affirmative Procurement / Empowerment	
6. No conflict of interest e.g. all cost savings are passed on to client	
7. Other:	

6.2.1 Construction Management is a better suited building procurement system on projects whereby empowerment of emerging contractors and SMMEs is of paramount importance in the success of the project as work is broken down into smaller and more manageable packages to allow smaller businesses to participate.

Agree

Do not agree

6.2.2 Please state reasons for your answer in 6.2.1 above:

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6.3 In your opinion, what are the shortcomings of CM ?

Lack of a Firm Price when construction commences	
Increased risk for client - due to increased number of smaller contractors in contract with	
Other:	
Other:	

## 7. RECIPES FOR SUCCESS OR FAILURE

7.1 Why did you decide to use construction management ?

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7.2 Did the use of construction management as a building procurement system worsen or improve your attainment of the following client objectives (tick applicable box i.e. worsened or improved) ?

Client Objective	Improved	Worsened
1. Cost / Budget		
2. Time		
3. Quality		
4. Affirmative Procurement / Empowerment		
5. Overall Client Satisfaction		

7.3 Were most of your construction management projects successful ?

Yes  No

7.4 Please indicate what you consider to be critical success factors on construction management projects ? Please indicate by ranking each option from 1 (most important to 9 (least important).

1. Clarity of Roles and responsibilities between client, professional team and construction manager	
2. Early and correct selection of construction manager	
3. Proper management of interfaces between trade contractors	
4. Cost control and value engineering during design	
5. Development of a realistic budget	
6. Development of a realistic schedule / programme	
7. Development of adequate contracts for consultants and trade contractors	
8. Apply CM in its purest form ("without risk")	
9. Application of critical chain techniques to further shorten project duration	

7.5 No statutory fee scales are in place for construction management. Did the construction manager charge an hourly fee, a lump sum / fixed fee or a percentage fee based on a sliding scale ?

Sliding Scale % Fee     Fixed Fee (Lump Sum)     Hourly Rate

7.6 Which of the following suite / forms of contract did you use on your construction management project ? Which of these do you feel best suits a construction management project ?

Suite / Form of Contract	Used	Best Suited
New Engineering Contract (NEC)		
JBCC (1990) or JBCC 2000		
General Conditions of Contract for Civil Works		
FIDIC		
White Form		

7.7 What problems did you encounter on your construction management project/s?

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7.8 How were these problems resolved and what lessons were learnt ?

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7.9 Do you intend using construction management on some of your projects in the future ?

Yes     No

**THE END**

*Thank you for participating in this survey.*

Would you like to obtain a summary of the results of this survey ?

Yes  No

If so, kindly provide us with your contact details below:

*Name (Optional):* \_\_\_\_\_

*E-mail Address:* \_\_\_\_\_

*Fax Number:* \_\_\_\_\_

*Appendix C:*

*Analysis of Survey Results*

**DISTRIBUTION AND RESPONSE:**

Total Number of Questionnaires Distributed:	112
Total number of respondents:	23
Response Rate:	21%

**SECTION A: (To be completed by all respondents)**

**1. BIOGRAPHICAL DETAILS:**

4.6 What is your occupation, relative to the construction industry ?

48	Practising Built Environment Professional
44	Client / Developer
8%	Other, please specify: Academics, Constr. Strategy Consultants etc

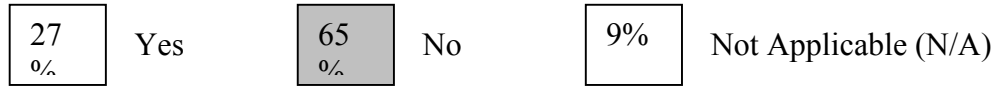
1.2 What is your professional background ?

9%	Construction Manager
48	Construction Project Manager
15	Architect
12	Quantity Surveyor
15	Civil and/or Structural Engineer
0%	Electrical and/or Mechanical Engineer
0%	Other, please specify: _____

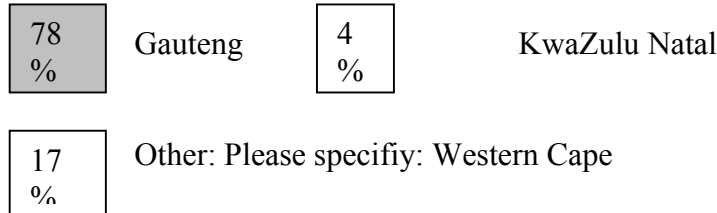
Note: Some respondents had more than one professional background especially if they were practising as construction project managers.



1.3 If practising as a construction manager and/or construction project manager, have you applied for registration with the SA Council for Construction and Project Management Professions (SACCPMP) ?



1.4 Which province are you based in ?



**2. CLIENT OBJECTIVES, PROJECT SUCCESS AND BUILDING PROCUREMENT SYSTEMS**

2.1 Kindly indicate your level of knowledge of the following building procurement systems on a scale of 1 (no knowledge at all) to 5 (excellent knowledge):

Traditional System (with or without project management)	1
Management Contracting	3
Construction Management	2
Design & Build (including turnkey)	4
Design and Manage (including Build, Operate & Transfer etc)	5

Please note that the level of knowledge of construction management, management contracting and design & build was almost the same.

2.2 Do you always consider all possible building procurement systems when you start a new construction project ?



2.3 Do you believe that there is a relationship between building procurement selection and the attainment of client objectives (project success) ?



**3. CONSTRUCTION MANAGEMENT:**

3.1 Have you recently (past 10 years) been involved in a South African construction project whereby construction management was used as a building procurement system ?



3.2 If you have not used construction management before, kindly indicate your reasons for not utilising it:

Insufficient knowledge of the system	60%
Suitable project has not come up yet	40%
Client did not prefer to use CM	0%
Principal agent did not prefer to use CM	0%
Other project team members did not prefer use of CM	0%

3.3 In your opinion, which of the following built environment professionals are best suited to offer construction management services (please tick applicable one/s) ?

27 %	Construction Manager
42 %	Construction Project Manager
8%	Architect
13 %	Quantity Surveyor
6%	Civil and/or Structural Engineer
2%	Electrical and/or Mechanical Engineer
2%	Other, please specify: _____

3.4 In your opinion, which of the following organisations are best suited to offer construction management services (please tick applicable one/s)?

31 %	Building and/or Civil Contractors
39 %	Professional / Specialist Project Management Firms
8%	Architectural Firms
12 %	Quantity Surveyor Firms
6%	Civil and/or Structural Engineer Firms
2%	Electrical and/or Mechanical Engineering Firms
2%	Other, please specify: _____

***If your answer to 3.1 was yes, please proceed to answer section B. If your answer was no, then you may proceed to the end of the questionnaire. Thank you for participating in the survey.***

**SECTION B: (To be completed by respondents with construction management experience in SA only)**

**4. FORMS OF CONSTRUCTION MANAGEMENT**

4.1 Which form of construction management have you used on your projects?

69  
n/ Pure CM (“not at Risk”)
 25  
n/ CM “at Risk”
 6% Not Sure

4.2 Which variant/s of the above mentioned forms of construction management are you familiar with and / or have you used previously ? *(please indicate yes with Y and no with N, in both columns)*

<b>Variant of Construction Management</b>	<b>Familiar With</b>	<b>Used Previously</b>
Pure Agency CM with general contracting and Hourly CM Fee	4	4
Pure Agency CM with General Contracting and a Lump Sum CM Fee	1	1
Pure Agency CM with Phased Construction <i>(construction by various contractors, at element level, &amp; tendering starts before design ends)</i>	3	2
Pure Agency - Multi Prime <i>(CM co-ordinates various contractors, at trade level, that contract directly with the client).</i>	2	3
Pure Agency - Multi Prime with a “Soft” Cost Guarantee	7	7
Pure Agency - Multi Prime, CM guarantees Price and Holds Trade Contracts <i>(CM contracts directly with trade contractors)</i>	5	5
The CM Bonds the Project <i>(guarantees full performance of the project)</i>	6	6

Note: Numbers next to each option indicate ranking from 1 (most used / familiar) to 7 (least familiar / used).

## 5. ROLE PLAYERS IN CONSTRUCTION MANAGEMENT

5.1 Which member of the professional team was appointed as the client's principal agent, in most instances on your CM projects ?

33 %	Construction Manager
50 %	Construction Project Manager
11 %	Architect
6%	Other: Please specify: consulting engineer

Note: Some respondents indicated that the same organisation performed construction manager and project management functions.

5.2 What was the client's level of involvement on the CM project/s ?

50 %	High	31 %	Average	19 %	Low
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5.4 What was the level of inter-organisational conflict on your CM projects ?

27%	High	46%	Average	27%	Low
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## 6. AN ARGUMENT FOR AND AGAINST CONSTRUCTION MANAGEMENT

6.1 In your opinion, which of the following are the benefits of CM? Please indicate by ranking each benefit from 1 (most important) to 9 (least important)

Cost Reduction	2
Design Flexibility	6
Full Control of the Construction Process	3
Fast Tracking (Quicker Delivery)	5
Affirmative Procurement / Empowerment	4
No conflict of interest e.g. all cost savings are passed on to client	1
Other: risk management, non adversarial relationships etc.	7

6.2.1 Construction Management is a better suited building procurement system on projects whereby empowerment of emerging contractors and SMMEs is of paramount importance in the success of the project as work is broken down into smaller and more manageable packages to allow smaller businesses to participate.

88 % Agree 12 % Do not agree

6.2.2 Please state reasons for your answer in 6.2.1 above:

Various reasons were given. Some of these were as follows:

- More opportunity to involve SMMEs, less risk to client: spread over more entities, use only SMMEs that are experts on each package.
- CPM controls the project
- Limiting risk of contract performance to a specific element of tender package
- It's suited only to the extent that the client is committed to empowerment which is hardly ever the case.
- Affirmative procurement expertise resides with the "professionals" as opposed to out and out CMs therefore creates a knowledge gap in terms of applying AP.
- Smaller packages allow access to smaller because, giving additional opportunities to

contract (incl providing guarantees).

- Proper management function
- Client has more direct control of appointment.
- CM able to assist in the day-to-day management of the trade contractors and provide strong management expertise.
- Other building procurement systems can offer the same to SMMEs
- Allows mentoring of SMMEs
- Proper assistance & empowerment can be implemented as there is no conflict of interest between CM & subcontractor.
- CM can & will assist sub contractors in being efficient in getting the job done as quickly and painlessly as possible.
- The employment of SMMEs on contracts is not purely around time & performance risk but also about the ability to carry financial risk.
- CM as a service can reduce the risk by interrogation before award but can not carry the risk. Unless it's a pre-requisite of the CM appointment.
- Skills transfer to SMMEs does not get carried forward beneficially through CM appointment.
- In traditional system, main contractor takes risk of emerging contractors. In CM, client takes risk.

### 6.3 In your opinion, what are the shortcomings of CM ?

Lack of a Firm Price when construction commences	30%
Increased risk for client - due to increased number of smaller contractors in contract with	50%
Other: <input type="checkbox"/> More administration for client in terms of payments, guarantees, contracts, etc. <input type="checkbox"/> Administration must be meticulous & comprehensive. <input type="checkbox"/> Construction Project Manager must be an expert and control the process well. <input type="checkbox"/> Price needs to be fixed beforehand. <input type="checkbox"/> Lack of understanding of CM by industry. <input type="checkbox"/> Not suitable for projects with high aesthetic and prestige	20%

<p>requirements</p> <ul style="list-style-type: none"> <li>❑ Hard to implement in conditions where there are rigid tender procedures (such as state tender board) due to fluidity of prices.</li> <li>❑ Client is unlikely to know who he is dealing with.</li> </ul>	
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## 7. RECIPES FOR SUCCESS OR FAILURE

### 7.1 Why did you decide to use construction management ?

Various answers were given. Some of these were as follows:

- To accommodate empowerment of emerging contractors & SMMEs.
- Better control over all processes.
- Could select and use specialists for each package.
- Could customise each package to suit requirements
- If one turns sour, rest still runs
- "subs" paid directly and regularly
- Facility for variation control.
- It was work of a fit-out nature
- Extent of project was not determined at the time of commencement.
- Independence and objectivity
- Professional management services
- To reduce costs, protect sub contractor, avoid conflict & contractual claims, quality.
- Was a client requirement - client based in UK. Also widely used in UK.
- The nature of the project indicates the benefits - if no benefit, why use that system ?
- Client needed PM but saw no benefit unless it took on CM responsibilities. Greater involvement in procurement process by professional
- Team and client. Cost & time savings.
- I do not use it except in small projects where the goal is the promotion, mentorship & development of emerging contractors. The risks are too high in large contracts and the financial returns achieved do not justify the additional headaches & higher PI premiums.



- As a project management company we often end up doing CM on some direct contractors to save profit & attendance of main contractor and often end up stepping in to assist a weak Main Contractor in the interests of the project.

7.2 Did the use of construction management as a building procurement system worsen or improve your attainment of the following client objectives (tick applicable box i.e. worsened or improved) ?

Client Objective	Improved	Worsened
Cost / Budget	75%	25%
Time	67%	33%
Quality	64%	36%
Affirmative Procurement / Empowerment	92%	8%
Overall Client Satisfaction	77%	23%

Note: Some of the respondents stated that an improvement in each of these objectives only resulted from proper implementation of CM. Some clearly stated that these benefits can only result if the project is well run - if not controlled, it could be "a nightmare."

7.3 Were most of your construction management projects successful ?



7.4 Please indicate what you consider to be critical success factors on construction management projects ? Please indicate by ranking each option from 1 (most important) to 9 (least important).

Clarity of Roles and responsibilities between client, professional team and construction manager	2
Early and correct selection of construction manager	1
Proper management of interfaces between trade contractors	3
Cost control and value engineering during design	5

Development of a realistic budget	6
Development of a realistic schedule / programme	4
Development of adequate contracts for consultants and trade contractors	8
Apply CM in its purest form ("without risk")	9
Application of critical chain techniques to further shorten project duration	7

7.5 No statutory fee scales are in place for construction management. Did the construction manager charge an hourly fee, a lump sum / fixed fee or a percentage fee based on a sliding scale ?



7.6 Which of the following suite / forms of contract did you use on your construction management project ? Which of these do you feel best suits a construction management project ?

Suite / Form of Contract	Used	Best Suited
New Engineering Contract (NEC)	15%	15%
JBCC (1990) or JBCC 2000	56%	62%
General Conditions of Contract for Civil Works	15%	15%
FIDIC	7%	8%
White Form	7%	0%

7.7 What problems did you encounter on your construction management projects?

- No major problems encountered
- Clearly defined responsibilities for various contractors (cleaning, rubble removal, etc) / interface between parties.
- Additional admin with respect to payments, contracts, guarantees etc.

- Day to day management of many small contractors
- No real identity of "contractor": CPM player & referee.
- Lack of competency of empowerment contractors
- Highly time consuming compared with traditional project management discipline
- The construction methodologies adopted by the tenderers often differ from WBS prepared by CM
- Used CM at Risk - client kept on wanting to see savings & wanted to re-negotiate contract often.
- Role clarification.
- Subcontractors were not able to meet all the requirements of the JBCC subcontract agreement.
- Budget, time & financial soundness of contractors
- Poor management, under resourced & poor programming
- Insolvency of contractors
- Client changes
- "client" contractors
- Very low profit margin - benefit to client far outweighs benefit to CM.
- Client role definition required early. Ensuring entire team is familiar with project control systems being used.
- Client forgets that risk of non-performance is theirs in pure CM with no risk.

#### 7.8 How were these problems resolved and what lessons were learnt ?

Various solutions were used to resolve the problems. In some instances, however, no solutions were found. Some of the solutions to problems encountered were as follows:

- Not really resolved. Solution was to avoid this type of contracting.
- Problems were relatively minor and we were able to make contingency plans.

- To resolve the problem with defining responsibilities for various contractors (cleaning, rubble removal, etc) CM divided costs between relevant contractors. Other respondents stated that horizontal takeovers should be effected between subcontractors and effective procedures instituted.
- On the day to day management of many small contractors it was suggested that effective procedures need to be instituted and follow-ups prior to D-day made.
- To resolve lack of competency of smaller contractors and the fact that it was more time consuming, additional resources were obtained & the programme was continuously revised.
- To resolve role clarification problems, it was recommended that roles and responsibilities are defined at initial stages on future projects.
- The issue regarding many client changes was not resolved but resulted in the client paying more.
- The problem with low profit margins for the CM was not resolved - it was stated that the efficiency of the subcontractor impacts directly on profitability. To resolve employ principal contractor unless circumstances / costs dictate otherwise.
- To resolve problem of the client not understanding that they have to take greater risk in "CM without risk", it must be clearly stated and understood by client representative from the outset that they have to take greater risk in such instances

7.9 Do you intend using construction management on some of your projects in the future ?



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**THE END**

*Appendix D:*

*Typical Employer / Client – Construction Manager Agreement  
(source: Bovis Lend Lease Plc - copyright).*