

https://dspace.org/

The relationship between project performance of emerging contractors in government infrastructure projects and their experience and technical qualifications: an analysis of 30 projects conducted in the Mpumalanga Province over the 2011-2013 period

Mohlala, Fate Tharullo

2016
http://hdl.handle.net/10539/20061

Downloaded from a DSpace repository. https://dspace.org/

THE RELATIONSHIP BETWEEN PROJECT PERFORMANCE OF EMERGING CONTRACTORS IN GOVERNMENT INFRASTRUCTURE PROJECTS AND THEIR EXPERIENCE AND TECHNICAL QUALIFICATIONS: AN ANALYSIS OF 30 PROJECTS CONDUCTED IN THE MPUMALANGA PROVINCE OVER THE 2011-2013 PERIOD

Fate Tharullo Mohlala

A research report submitted to the Faculty of Engineering and the Built Environment, University of the Witwatersrand, Johannesburg, in partial fulfilment of the requirements for the degree of Master of Science in Engineering

Johannesburg 2015

DECLARATION

I declare that this research report is my own unaided work. It is being submitted for the Degree of Master of Science in Engineering to the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination in any other University.

_____

Fate Tharullo Mohlala

11th day of **August, 2015**

ABSTRACT

This research set out to investigate two relationships; the relationship between technical qualifications and emerging contractor project performance, and the relationship between experience and emerging contractor project performance. The focus was on emerging contractors in the public sector. This study was motivated by the notion that emerging contractors generally fail and have poor project performance.

The objective of the report was to determine the general factors that affect emerging contractor performance and demonstrate the relationship between competence and project performance. Information pertaining to progress and performance for thirty projects from a government institution in Mpumalanga Province was collected. This information included contact details of the contractors who conducted the 30 government infrastructure projects. The contact details were used to collect contractors' curriculum vitaes and company profiles in order to extract information on qualifications and experience.

Literature has shown that the most prevalent issues facing emerging contractors in South Africa can be attributed to the contractors' competencies. These competencies include skills, experience, qualifications and project management knowledge. Other factors that affect emerging contractor performance include project delays caused by late payments by clients, shortage of labour and lack of financial resources and equipment.

The results of this study showed that contractors with technical qualifications and experience generally perform better than those with no technical background. It was also found that where there is no technical background, the level of education also affects the level of project performance. This study demonstrated the importance of the number of technical or construction related projects conducted by an emerging contractor company as compared to the number of years that the company has been in operation. The number of projects conducted, regardless of timeline, is more beneficial to project performance than the number of years in operation in the construction industry.

This study recommends that focus should be drawn to the definite need to develop emerging contractor competence through skills development, training, collaborations and knowledge sharing. Competence development should focus on transferring technical knowledge and experience through policy formulation, collaboration of government and educational or training institutes. Focus should also be drawn to developing project management competence of emerging contractors in the South African public sector.

DEDICATION

I dedicate this report to my mother, Mildred Shabangu, for inspiring me and enabling me to follow in her footsteps. To Faith, Virginia and AJ, thank you for being the light at the end of the tunnel. And finally, to the love of my life, my husband, Tapiwa Muzondo; thank you for your patience, wisdom and support.

ACKNOWLEDGEMENTS

This research would not have been successful without the cooperation and assistance of the emerging contractors who took time to send their personal information. I would also like to acknowledge my supervisor, Prof McCutcheon for his encouragement, advice and wisdom.

TABLE OF CONTENTS

DECLARATION I
ABSTRACT II
DEDICATION IV
ACKNOWLEDGEMENTS V
LIST OF FIGURES IX
LIST OF TABLES X
NOMENCLATURE/LIST OF ACRONYMS XI
CHAPTER 1: INTRODUCTION 1
1.1 Background 2
1.2 Problem statement 3
1.3 Research questions 4
1.4 Research objectives 4
1.5 Delineations 4
1.6 Assumptions 5
1.7 research statements 5
1.8 Importance of study 6
1.9 Report structure 6
CHAPTER 2: LITERATURE REVIEW 7
2.1 Success rate of emerging contractors 7
2.2 Contractor CIDB registration 8
2.3 Definition of "emerging contractor" 11
2.4 Definition of "project performance" 13
2.5 Factors related to project performance 14
2.5.1 Emerging contractor competencies 14
2.5.1.1 Training and skills development 15
2.5.1.2 Technical qualifications and experience 16
2.5.1.3 Project management competence 18
2.5.3 Project delays 19
2.5.4 The tendering process 22
2.5.5 Emerging contractor development programmes 24
2.5.6 Unethical conduct 25

2.6 Summary of literature review 26
CHAPTER 3: METHODOLOGY 29
3.1 Research execution plan 32
3.2 Equipment and resources 34
3.2.1 Data collection 34
3.2.2 Reliability and validity 35
3.2.2.1 Reliability 35
3.2.2.2 Validity 35
3.2.3 Ethical considerations 36
CHAPTER 4: RESULTS AND ANALYSIS 37
4.1 Description of data 37
4.2 Contractor profile 38
4.3 Performance indicator 41
4.4 Project performance 42
4.5 Contractor educational profile 47
4.5.1 Relationship between qualifications and project performance 49
4.5.1.1 Qualification type and project performance 50
4.5.1.2 Qualification level and project performance 51
4.6 Contractors experience profile 52
4.6.1 Relationship between experience and project performance 54
4.6.1.1 Personal experience and project performance 54
4.6.1.2 Emerging contractor's company experience and project performance 56
4.6.1.3 Years in the construction industry and project performance . 58
4.6.1.4 CIDB grade and project performance 60
4.7 Comparison of joint ventures to non-joint ventures 62
CHAPTER 5: SUMMARY, CONCLUSION AND RECOMMENDATIONS 63
5.1 Summary 63
5.2 Conclusion 65
5.3 Recommendations 66
5.3.1 Tendering and procurement process 66
5.3.2 Policy 66
5.3.3 Collaboration and information sharing 66
5.3.4 Contracting companies 67

5.3.5 Project management competence development 67
5.3.6 Recommendations for further study 68
CHAPTER 6: REFERENCES 69
APPENDIX A: CIDB CONTRACTOR REGISTRATION CATEGORIES 76
APPENDIX B: CIDB CONTRACTOR REGISTRATION FORM 79
APPENDIX C: NUMBER OF CONTRACTORS TRAINED PER PROVINCE 84
APPENDIX D: TENDER EVALUATION CRITERIA FOR GOVERNMENT TENDERS 85
APPENDIX E: STANDARD EMAIL SENT TO CONTRACTORS 90
APPENDIX F: CONTRACTOR COMPANY EXPERIENCE 91
APPENDIX G: CONTRACTOR CIDB GRADING WITH THEIR RESPECTIVE DEGREES OF DELAY 95

LIST OF FIGURES

Figure 2.1 Tender evaluation process.....23
Figure 2.2 Emerging contractor development model.....27
Figure 3.1 Methodology and process diagram.....31
Figure 3.2 Block 1 of the research execution plan.....32
Figure 3.3 Block 2 of the research execution plan.....33
Figure 4.1 Contractor distribution by gender.....37
Figure 4.2 Respondents distribution by gender.....38
Figure 4.3 Distribution of CE contractors by grading.....39
Figure 4.4 Distribution of GB contractors by grading.....40
Figure 4.5 Percentage of projects to the corresponding DoD range.....45
Figure 4.6 Percentage of contractors to their qualification bands.....46
Figure 4.7 Proportion of technical to non-technical qualifications.....47
Figure 4.8 Comparison of project performance by qualification types.....49
Figure 4.9 Comparison of project performance by qualification bands.....50
Figure 4.10 Proportion of contractors with construction related experience.....52
Figure 4.11 Relationship between personal experience and project performance.....54
Figure 4.12 Relationship between company experience and project performance.....56
Figure 4.13 Relationship between number of years in the industry and project performance.....58
Figure 4.14 Relationship between CIDB grading and project performance.....60
Figure 4.15 Comparison of joint venture to non-joint ventures.....61

LIST OF TABLES

Table 2.1 Contractor registration grades and contract values.....10

Table 2.2 Comparison of Malaysian CIDB grading to the SA CIDB grading systems....12

Table 2.3 Qualifications of SA's top five construction companies with revenues for 2014.....17

Table 2.4 Relationship between project delays and compensation.....21

Table 4.1 Demonstration of project performance in government infrastructure projects.....42

Table 4.2 Comparison of qualification types and bands by project performance.....48

Table 4.3 Comparison of staff personal experience in the construction industry by project performance.....54

NOMENCLATURE/LIST OF ACRONYMS

∞	Incomplete projects/abandoned projects
CEO	Chief Executive Officer
CIDB	Construction Industry Development Board
CV	Curriculum Vitae
DoD	Degree of delay
dti	Department of Trade and Industry
ECDP	Emerging Contractor Development Programme
GCC	General Conditions of Contract
MP	Mpumalanga Province
NCDP	National Contractor Development Programme
PPPFA	Preferential Procurement Policy Framework Act No. 5 of 2000
RSA	Republic of South Africa
RM	Malaysian Ringgit
SMME	small, medium and micro enterprise
UAE	United Arab Emirates
JV	Joint Venture
ZAR	South African Rand

CHAPTER 1: INTRODUCTION

Economic development can be measured by the physical development of infrastructure such as bridges, roads and buildings, and job creation (Alzahrani and Emsley, 2013) which are mainly offered by the civil engineering and general building construction sectors. Emerging contractors or "small, medium and micro enterprises" (SMMEs) are also essential for job creation and poverty alleviation in developing African countries (Tushabomwe-Kazooba, 2006; Okpara and Wynn, 2007; Okpara and Kabongo, 2009). Therefore, the development of emerging contractors contributes to the development of the country. Given that the primary client of these contractors is the government (Construction Industry Development Board (CIDB), 2011a); there is a need to investigate their project performance in government infrastructure projects.

Defining project performance is complex (Fouché and Rolstadås, 2010). The three main components of project management; time, cost and quality, are usually used to measure project performance (Harrison and Lock, 2004; Turner, 1999 and Cheung, Suen and Cheung, 2004). Turner (1999) adds that scope and risk should be covered in the project performance indicators. According to Hartman (2000) stakeholder satisfaction is an indication project performance. It is evident that there are a number of performance measures, and it may be that not all can be used to measure performance in a particular project. As such, it is conceivable that each project would have measures appropriate to its goals. Taking into consideration all the performance indicators highlighted by these authors, one can conclude that project performance measurement criteria are dependent on the types of goals set for a particular project (Fouché and Rolstadås, 2010).

Determining project goals and, therefore, the indicators to be used to measure project performance, is vital to assessing and quantifying project performance. This then forms a basis for determining the factors that affect project performance. Many studies have been conducted in order to determine the factors that affect contractor performance in developing countries (Sweis *et al.*, 2014). A study done by Faridi and El-Sayegh (2006) in the United Arab Emirates (UAE) shows that shortage of skilled labour, poor supervision and site management, inadequate leadership and equipment failure have contributed to delays in construction projects. According to Hanson, Mbachu, and Nkando (2003) contractor project

performance in South Africa is affected by poor workmanship and contractor incompetence, while Gharakhani, Sinaki, Dobakhshari, and Rahmati (2013) found that reputation affects client satisfaction and, therefore, perceived contractor performance.

This research was carried out in order to determine what factors within the construction industry, specifically in the South African public sector, are related to contractor project performance. It is expected that in order for an emerging contractor to develop on a business level, there is a need to perform at the project level. Completion of a project in the specified time is considered to be a major criterion for the measurement of project success (Rwelamila and Hall, 1995). This measurement will be used in this research to assess project performance of emerging contractors.

1.1 BACKGROUND

Part of the legacy of the apartheid government in South Africa was a lack of skills development. A high unemployment rate and slow development of small or emerging businesses were also part and parcel of that legacy. These issues were predominantly conspicuous in the non-white community. According to Magoro and Brynard (2010) government's main objective as a client is to achieve a finished product and has no interest in the process involved in achieving such an objective. However, South African legislation shows that the South African government has been instrumental in 'righting the wrongs' of the apartheid government by using government procurement as a tool. Government has enacted legislation ensuring that the procurement processes followed are aligned with this objective. Section 217 of the Constitution of the Republic of South Africa, Act No. 108 of 1996, states:

> "*When an organ of state in the national, provincial or local sphere of government, or any other institution identified in national legislation, contracts for goods or services, it must do so in accordance with a system which is fair, equitable, transparent, competitive and cost-effective.*"

The Act further adds that procurement policies should allow for,

> "*The protection or advancement of persons, or categories of persons, disadvantaged by unfair discrimination*."

The Preferential Procurement Policy Framework Act No. 5 of 2000 (PPPFA) is such a policy and has the following objective:

> "*to provide for categories of preferences in the allocation of contracts and the protection or advancemnet of persons disadavantaged by unfair discrimination*."

It is therefore evident that the South African government has attempted to create a platform for developing emerging contractors in the South African construction industry. Literature, however, has shown that the small contractors have poor performance and a low success rate (CIDB, 2009). Therefore, government intervention through policy has not been adequate in ensuring the success of emerging contractors. Research is needed to establish whether or not there are other factors that affect emerging contractor performance in government infrastructure projects other than the inadequacy of government intervention as claimed by Magoro and Brynard (2010). There is a need to determine whether the contractors' attributes such as skills, experience and qualifications affect their performance in construction projects.

1.2 PROBLEM STATEMENT

The South African government and other professional bodies in the construction industry have developed frameworks for emerging contractor development. However, it has been observed that most emerging contractors in the public sector perform poorly. Factors such as time, cost, quality, and client satisfaction are some of the indicators that are used to measure performance in a project environment (Cheung *et al.*, 2004). Most emerging contractors in government infrastructure projects fall short when assessed against these indicators. Zulu and Chileshe (2008) found that contractor performance in Zambia is below expectation and most projects are delayed or do not reach completion stage. The South African construction industry is no exception.

Even though the South African government has developed policies and legislation as forms of intervention in order to aid the development of emerging contractors; literature suggests

that emerging contractor performance is generally poor. The frequent failure of emerging contractors, therefore, suggests that government intervention has not been effective or sufficient. Many emerging contractors lack the necessary business, technical and project management skills, qualifications, knowledge and experience necessary to meet the objectives in public sector projects (Cheung *et al*., 2004). As a result, most government infrastructure projects are delayed and experience cost overruns. Others remain incomplete.

1.3 RESEARCH QUESTIONS

- What are the factors that affect emerging contractor performance in government infrastructure projects?
- Is there a relationship between project performance and contractor qualifications and experience?

1.4 RESEARCH OBJECTIVES

The primary aim of this study is to determine the factors that affect emerging contractor performance in government infrastructure projects in South Africa. The secondary objectives of the research are to:

- Determine the gaps or limitations in literature in order to use empirical data to address such issues.
- Analyse the relationship between emerging contractors' technical qualifications and project performance.
- Analyse the relationship between emerging contractors' experience and project performance.

1.5 DELINEATIONS

This research focuses on emerging contractors registered with the Construction Industry Development Board (CIDB) from Grade 2 to Grade 6 in both Civil Engineering (CE) and General Building (GB) categories, in the public sector. The emerging contractors under study are drawn from Mpumalanga Province with a single government organisation being used as a case study. This research does not include projects that are carried out by emerging contractors in the private sector.

1.6 ASSUMPTIONS

Assumption 1:

All South African state organs use emerging contractors for the delivery or implementation of government infrastructure projects.

Assumption 2:

All contractors who are awarded or have been awarded contracts for government infrastructure projects are registered with the CIDB. According to the Construction industry Development Board Act No. 38 of 2000, all public sector organs can only award contracts to contractors registered with the CIDB for construction projects (CIDB, 2011a).

Assumption 3:

The CIDB grading is a measure and reflection of the emerging contractors' experience in the construction industry. It is assumed that all contractors initially register with the CIDB in lower grades and progress through the years aided by the type and value of projects they undertake.

1.7 RESEARCH STATEMENTS

Research statement 1:

Emerging contractors with *technical qualifications* will have better project performance than those without *technical qualifications*. The qualifications should be those of the owner of the enterprise or its core staff.

Research statement 2:

Emerging contractors with *technically related experience* will have better project performance than those with *non-technical experience*. Experience is gained by attaining the relevant skills required in the construction industry and these skills develop competence. In addition, the combination of skills and experience develops competence.

1.8 IMPORTANCE OF STUDY

- Development of small contractors can assist in job creation and redistribution of wealth especially for the previously disadvantaged community.
- Identifying the problems facing emerging contractors can assist the government in developing policies and methods to address the failure of contractors and as a result, obtain better results and returns on the investments into the projects, in terms of quality and community satisfaction.

1.9 REPORT STRUCTURE

Chapter 1: Introduction

This chapter includes the problem statement, delineations, assumptions and hypotheses. It also contains the introduction and background to the research.

Chapter 2: Literature review

The literature review is contained in this chapter. The review focuses on small business failure and the key issues that are facing emerging contractors. This chapter also demonstrates the limitations in the systems and regulations put in place to assist emerging contractors in South Africa.

Chapter 3: Methodology

This chapter presents the methodology followed in conducting the research along with the process followed in gathering the empirical data. This chapter also highlights the ethical issues that needed consideration when gathering the data.

Chapter 4: Results and analysis

The results and analysis chapter outlines the findings from the empirical study. This chapter demonstrates the relationships between technical qualifications and experience and project performance.

Chapter 5: Summary, conclusion and recommendations

This chapter provides the summary of the research, the conclusion and recommendations.

CHAPTER 2: LITERATURE REVIEW

Many studies have been conducted in order to determine the factors that affect contractor performance in developing countries (Sweis *et al.*, 2014). A preliminary literature survey was conducted with the aim of finding out what work has been done in the area of emerging contractor performance in public sector projects. A full literature review was conducted on the study area with special attention drawn to the South African context. The literature was analysed in order to answer the first primary research question, which is; what are the factors that affect contractor performance in government infrastructure projects?

The secondary objective is to establish the limitations of previous work done in the study area in order to establish a methodology for the empirical study. The literature review was also used to form a basis for the research methodology and give an idea of what methods are best suited for this study area.

2.1 SUCCESS RATE OF EMERGING CONTRACTORS

The SMME sector contributes approximately 67% of jobs in South Africa (Department of Trade and Industry (dti), 2004). According to Pretorius (2009) 50 to 90% of South African small businesses fail; 32% of which fail in the first seven years of operation (Nemaenzhe, 2010). Small business failure can result in financial losses (Shepherd, Wiklund and Haynie, 2009), loss of resources (Peacock, 2000) and job losses (Argenti, 1976; Van Witteloostujin, 1998; Temtime and Pansiri, 2004). The high failure rate of SMMEs in South Africa is of great concern. Small businesses or SMMEs such as emerging contractor companies contribute significantly to economic growth and job creation in South Africa (van Eeden, Viviers and Venter, 2003).

It is, therefore, important for the country's economic growth that emerging contractor businesses perform on a project and business level. Key performance indicators need to be identified and defined in order to evaluate emerging contractor performance. The outcome will then be used to develop recommendations for improving contractor project and business performance in order to aid sustainable development.

2.2 CONTRACTOR CIDB REGISTRATION

All contractors who intend to bid for or participate in tenders in the South African public sector need to be registered with the CIDB (CIDB, 2011a). It is essential to determine the contractor characteristics that are considered for registration and progression through CIDB grades. The analysis of the CIDB registration process will be used to determine whether or not contractor project performance is used as a measure of eligibility for registration or progression through grades. It will also be determined if those measures are related to the contractors experience and technical qualifications.

The CIDB was established by an act of parliament of the Republic of South Africa (RSA). This is the Construction Industry Development Board Act No. 38 of 2000 which founded the regulatory body (CIDB) for the construction industry of South Africa. According to the Act, the objectives of the CIDB are (RSA, 2000):

- *promote the contribution of the construction industry in meeting national construction demand and in advancing—*
    - *national, social and economic development objectives;*
    - *industry performance, efficiency and competitiveness; and*
    - *improved value to clients;*
- *provide strategic leadership to construction industry stakeholders to stimulate sustainable growth, reform and improvement of the construction sector;*
- *determine and establish best practice that promotes—*
    - *improved industry stability;*
    - *improved industry performance, efficiency and effectiveness;*
    - *procurement and delivery management reform;*
    - *improved public sector delivery management;*
    - *national social and economic objectives, including—*
        - *growth of the emerging sector;*
        - *labour absorption in the construction industry;*
        - *improved labour relations; and*
        - *positive safety, health and environmental outcomes;*
    - *human resource development in the construction industry;*

- *promote best practice through the development and implementation of appropriate programmed and measures aimed at best practice and improved performance of public and private sector clients, contractors and other participants in the construction delivery process;*
- *promote uniform application of policy with regard to the construction industry throughout all spheres of Government;*
- *promote, establish or endorse—*
    - *uniform standards; and*
    - *ethical standards,*

  that regulate the actions, practices and procedures of parties engaged in construction contracts;
- *promote sustainable growth of the construction industry and the participation of the emerging sector therein;*
- *promote appropriate research on any matter related to the construction industry and its development;*
- *implement policy on construction industry development;*
- *advise the Minister on policy and programmed which impact on construction industry growth and development; and*
- *promote any other related objective.*

The CIDB, therefore, not only seeks to grow the South African economy through the construction industry, but also seeks to develop emerging contractors through research, support, and procurement policy formulation and advice.

Table 2.1 shows the 9 different grades in which contractors can be registered along with the corresponding contract value (CIDB, 2011a).

Table 2.1 Contractor registration grades and contract values (CIDB, 2011a)

Grade	**Tender value less than or equal to (R)**
1	200 000.00
2	650 000.00
3	2 000 000.00
4	4 000 000.00
5	6 500 000.00
6	13 000 000.00
7	40 000 000.00
8	130 000 000.00
9	No limit

Contractors are also classified on the category of work they can carry out, found in Appendix A. This study focuses on the Civil Engineering (CE) and General Building (GB) categories.

The registration for any of the grades is based on the financial capabilities and evidence of completed projects conducted by the contractor during the application process.
The CIDB requires the following documents for application (CIDB, 2011a):

- Application form (see Appendix B)
- Proof of company registration
- Identity documents
- Tax clearance certificate
- Electrical certificate for EB works
- Financial statement for the two years immediately preceding the application
- Track record documents (appointment or award letter, completion certificate, and payment certificate).

It is interesting to find that only electrical related type of works (EB) require some form of certification, which is not the case with the CE and GB works.

The CIDB 2012/2013 annual report states that amendments to the registration regulations were proposed (CIDB, 2013). These amendments include:

- Removal of the requirement for contractors to have registered professionals in their employee base;
- Reduction in the annual turnover requirements; and
- Reduction in track record requirements.

It is observed, from the requirement for the registration and progression from one grade to the next, that not much emphasis is placed on the contractors' technical qualifications. The proposed amendments are further indication that the CIDB does not put much emphasis on the technical qualifications of the contractor's employees and their business experience in the construction industry. The CIDB has, however, set up guidelines for reporting contractor performance. The contractor performance report should include records of contractors' breach of contract resulting in either termination and/or cancellation of contract (CIDB, 2013). These efforts by the CIDB indicate that importance is placed on client satisfaction which is a measure of project performance. Client satisfaction can also be used to indicate the performance of the contractor in relation to time, cost and quality.

2.3 DEFINITION OF "EMERGING CONTRACTOR"

There is no general definition of an emerging contractor (Storey, 1994; Eyiah, 2001). An "emerging contractor" can be defined as a "person or enterprise which is owned, managed and controlled by previously disadvantaged persons and which is overcoming business impediments arising from the legacy of apartheid" (CIDB, 2011a). These enterprises are also termed "small construction enterprises" and "small-scale contractors". Emerging contractors are generally characterized by limited capital resources, plant and equipment, and managerial support which affect their ability to acquire skilled labour and employ professionals (Eyiah, 2001).

Jaafar and Abdul-Aziz (2005) define emerging contractors as contractors that are registered with the Malaysian CIDB from grades G1 to G6. Table 2.2 shows the contract amounts for each grade and the corresponding SA CIDB grades highlighted in Table 2.1.

Table 2.2 Comparison of Malaysian CIDB grading to the SA CIDB grading systems

Malaysian CIDB Grades	**Malaysian Contract Amount (RM)**	**Contract amount in Rand (ZAR)**	**SA CIDB Grades**
G1	100 000.00	326 049.58	2
G2	500 000.00	1 630 247.91	3
G3	1 000 000.00	3 260 495.82	4
G4	3 000 000.00	9 781 487.46	6
G5	5 000 000.00	16 302 479.10	7
G6	10 000 000.00	33 604 958.20	7
G7	No limit	No limit	9
Source: Combination of Jaafar and Abdul-Aziz (2005), CIDB (2011a) and Google Finance (n.d)			

The Malaysian contract amounts, in Malaysian Ringgit (RM) were converted into the South African rand (ZAR) in order to compare the CIDB grades. The following factor was used to calculate the ZAR equivalent of the RM:

1 RM = 3.26 ZAR (Google Finance, n.d)

It should be noted that the exchange rate between the RM and the ZAR that was used was for the 13th of January 2015 only, and is subject to change.

Jaafar and Abdul-Aziz (2005) consider contractors that can tender for contracts up to R33.3 million as emerging or small and medium enterprises. The SA CIDB, on the other hand, classifies emerging contractors as those enterprises that are owned, managed and controlled by previously disadvantaged individuals (CIDB, 2011a) and does not classify them according to their financial capabilities.

This investigational project report, therefore, defines "emerging contractors" as:

> Small to medium contracting enterprises that are owned by individuals previously disadvantaged by the apartheid system of the pre-1994 South Africa and registered with the CIDB.

Other literature refers to this class of contractors as sub-contractors since they are mostly used on a sub-contract basis by large contracting companies when rendering services mainly

in the private sector. Emerging contractors that are under study in this paper have been used as the main contractors for the delivery of government infrastructure projects.

2.4 DEFINITION OF "PROJECT PERFORMANCE"

Performance measurement is a systematic process of assessing and quantifying past behaviours and activities (Neely, 1999). Project performance measurement is essential in order to determine whether or not project goals have been met for both the client and the contractor. A study conducted by Cheung *et al*. (2004) found that there are seven main key performance indicators; time, cost, quality, client satisfaction, client changes, business performance, and health and safety. According to the CIDB project performance can be measured against the following project parameters (CIDB, 2013):

- Time management;
- Cost management;
- Quality management;
- Health and safety management;
- Site management; and
- Sub-contractor management.

Thus, project performance can be defined as the actions taken through the life cycle of a project to meet pre-determined goals. These goals may be one of the seven key performance indicators identified by the CIDB (2013), those proposed by Cheung *et al*. (2004) or a combination thereof.

According to Xiao and Proverbs (2003) the improvement of project performance, which leads to improved contractor performance, can result in increased client satisfaction, better reputation and improved competiveness. Many authors attribute project performance to the contractors competence (Hanson *et* al., 2003; Iyer and Jha, 2005; Faridi and El-Sayegh, 2006). It is, therefore, important that performance indicators and project goals are clearly defined and understood by all stakeholders (the client, the engineer, the contractor and the user) at the beginning of the project. This will ensure that adequately competent contractors are appointed and, as a result, eliminate client dissatisfaction at project close-out.

2.5 FACTORS RELATED TO PROJECT PERFORMANCE

2.5.1 Emerging contractor competencies

Sweis *et al.* (2014) conducted a study on contractor performance at an international level in order to determine the most critical contractor performance factors in public infrastructure projects according to the perspectives of contractors, clients and engineers. The study found the following responses:

- Clients' perspective
    - Contractors' financial difficulties
    - Unacceptable construction techniques by contractors
    - Clients' financial difficulties
- Engineers' (consultants) perspective
    - Shortage of manpower or skilled labour
    - Poor planning and scheduling of projects
    - Contractors' financial difficulties
- Contractors' perspective
    - Changes in orders by clients
    - Contractors' financial difficulties
    - Clients' financial difficulties

From the above findings, it is observed that the most common factors affecting contractor performance are related to the contractors' ability to perform the work, that is, contractor competence. The studies also show that contractors' lack of financial resources is also a predominant factor with regards to contractor performance. It should be noted that due to the uniqueness of projects, it is difficult to generalize these factors. These findings do, however, form a basis for the need to assess contractor performance in the South African public sector.

Competence can be defined as the ability or potential to perform a particular task or job effectively (Rozewski and Malachowski, 2009) or the capacity to perform a given activity (Guillaume, Houe and Grabot, 2014) to achieve a predetermined goal to a particular standard (Peters and Zelewski, 2007). This involves the application of knowledge and skills and is likely to vary from one organization or contractor to the next (Guillaume *et al.*, 2014). It is clear that competence should involve, not only the ability to perform a given task, but

the application of the necessary skills and knowledge which are acquired before the given task. This is an indication that there may be a need to assess the level of emerging contractor competence before awarding of every contract as it may affect the performance during the construction phase of the project.

Literature has shown that most emerging contractors in the South African public sector lack these skills. According to Hanson *et al.* (2003) contractor performance in South Africa is affected by poor workmanship and contractor incompetence. This affects the contractor's track record or reputation and, therefore, the eligibility for future contracts. Gharakhani *et al.* (2013) found that reputation affects client or customer satisfaction. Operational skills which include project management and business skills such as planning and financial accounting are crucial for the success of any business (Thwala and Mvubu, 2008). Mofokeng (2012) also found that small and medium construction companies lack business and managerial experience. Previous literature (Fredland and Morris, 1976; Yusoff, 1995; Jo and Lee, 1996; Lin, 1998; Jaafar and Abdul-Aziz, 2005) has shown that managerial expertise and experience are vital for the success of any enterprise and have a significantly positive relationship to the performance of the enterprise. According to Croswell and McCutcheon (2001) some of the difficulties facing emerging contractors include lack of entrepreneurial, managerial, technical and administrative expertise. These skills and expertise are vital for emerging contractors' performance through the life cycle of a project and from one project to the next. The acquisition of competence is, thus, an on-going process, especially in project based enterprises (i.e. emerging contractor businesses) since each project is inherently unique. Thus, emphasis should also be put to continuous learning from one project to the next in order to improve emerging contractor competence in government infrastructure projects.

2.5.1.1 Training and skills development

Adams (1995) identified lack of skilled labour as one of the major causes of emerging contractor failure in the construction industry. Training, either on-the-job or through tertiary education, develops skills which results in development of competencies. Skills development can also occur through experience and the application of the acquired experience and knowledge (Edum-Fotwe and McCaffer, 2000).

The CIDB allocated R50 000 in the 2012/2013 financial for training of 512 contractors. The areas in which the contractors were trained were:

- Occupational health and safety;
- Construction management;
- Contract management;
- Pricing and tendering; and
- Financial management (CIDB, 2013).

Contractors from Mpumalanga Province (MP) were trained in construction management and contract management areas only, and amounted to only 8.2% of the total number of contractors who received training (CIDB, 2013). See Appendix C for the distribution of contractors who received training by province. This may be used as an indication of the lack of training in the province which causes high failure rates in infrastructure projects. It should also be noted that the contractors that received training were not trained in the area of financial management which is essential for the success of any business. The contractors from MP were also not part of the Pricing and Tendering training programme which is crucial for any contracting business to acquire contracts in the public sector.

Training is a necessity in the construction industry, lack of which, may result in skills shortage, shortage of labour and poor quality outputs (Gann and Senker, 2010). The lack of skilled labour results in competition for labour within the industry and, as a result, causes high labour prices for the contractor. Increased expenses such as high wages can lead to business failure.

2.5.1.2 Technical qualifications and experience

The study by Sweis *et al.* (2014) found that clients and engineers attribute contractors' poor performance to lack or shortage of technical professionals within their organizations. According to a study conducted in Germany, a combination of vocational training and formal qualifications is a great strength of the German construction labour force (Richter, 1998). It was also found that Germany has a high number of technically qualified construction workers even up to Masters level. According to Richter (1998) this is the support system and essential factor for entrepreneurship and self-employment in the German construction industry. The lack of technically qualified contractors was found to be the

primary cause of low productivity in the UK construction industry (Praise and Steedman, 1986; Clarke and Wall, 1996). Croswell and McCutcheon (2001) have also identified the lack technical expertise as a contributory factor to the poor performance of emerging contractors.

These studies highlight the importance of technical qualifications and experience in the construction industry. Most literature in the area of emerging contractor performance concentrate on financial and project management competencies. However, this section suggests that technical qualifications and experience contribute to performance. In addition, to ensure sustainability, institutions and construction companies should pass on their skills, knowledge and experience through training of incoming members into the industry (Richter, 1998). This can be achieved by collaboration between the government (public sector) and the private sector. Richter (1998) also highlights the importance of training and its relationship with competence and experience in the construction industry.

Table 2.3 shows SA's top five construction companies along with the corresponding qualifications of the Chief Executive Officers (CEO). The top five companies were selected in accordance with Carte (2012).

Table 2.3 Qualifications of SA's top five construction companies with revenues for 2014

Company	**CEO's Qualifications**	**Revenue (2014)**	**Source**
Aveng	BCom (Hons)	R53 billion	Aveng Group (2014)
Murray and Roberts	BEng (Mining)	R36 billion	Murray & Roberts (2014)
Wilson Bayly Holmes (WBHO)	BSc (Eng)	R25 billion	WBHO (2014)
Group Five	BScEng (Elec)	R15.3 billion	Group Five (2014)
Stefanutti Stocks	NDip (Civil)	R5.3 billion	Stefanutti Stocks (2014)

Table 2.3 further cements the notion that higher qualifications, either in the technical fields or financial or commercial fields, are important for the success of a construction or contractor company.

2.5.1.3 Project management competence

Since this report focuses on emerging contractors who are contracted for the implementation of government infrastructure projects, it is important to understand "project management competence". Project management competence can be defined as the execution of a project in an effective manner that involves the knowledge of the project environment, the application of project management and leadership skills, and personal growth in order to achieve preset goals (Suikki, Tromstedt and Haapasalo, 2006).

Some of the factors that affect contractor performance in the construction sector are poor project planning and scheduling by contractors (Sweis *et al*., 2014). These are fundamental project management skills which are essential for the successful implementation of every project. It is, therefore, essential that emerging contractors have qualified or experienced project management staff within their organisations. According to Edum-Fotwe and McCaffer (2000) project management competency can be achieved through a combination of acquired knowledge through training, and the application of skills and knowledge. Edum-Fotwe and McCaffer (2000) further states that the skills that are required of a construction project manager involve:

- Project, technical and team leadership;
- Communication (writing, oral, and listening);
- Negotiation; and
- Problem solving (problem definition and decision making).

Suikki *et al.* (2006) adds that training that is aimed at developing project management competence needs to focus on the following areas:

- Project planning and collaboration management
- Project scope management
- Project communication management
- Project human resources and leading people
- Project quality management

- Project risk management
- Project cost management
- Time management
- Actual market situation, strategy, development activities and project work

2.5.3 Project delays

Project delays or timely completion of projects can be used as another indicator of emerging contractors' project performance. It should be noted that not all delays are a reflection of a contractor's competence, project management skills and performance. It is therefore important to investigate the different causes of construction delays in order to determine the causes.

Delays are classified into two categories; excusable and non-excusable delays (Alkass, Mazerolle and Harris, 1996). Excusable delays include unforeseen events and those that are not linked to the contractor's actions or inactions, and are beyond the contractor's control (Alkass *et al.*, 1996). Contractors may not be penalised for such delays and would, therefore, be entitled to an extension of time. However, not all excusable delays warrant compensation. Project delays that are attributed to the client's actions, inactions and negligence are classified as excusable compensable delays (Alkass *et al.*, 1996). While, according to Alkass *et al.* (1996), excusable non-compensable delays are due to events that the client or the contractor are not responsible for, such as unprovoked strikes and natural events. The second category of project delays is non-excusable delays which result from the contractor's actions, inactions and negligence (Alkass *et al.*, 1996). The contractor is not entitled to any compensation for such delays and may suffer penalties.

The causes of project delays that are attributed to the contractor's actions or lack thereof can then be used to determine the solutions that can be used to limit such delays and, as a result, improve contractor performance. Project delays that are attributed to government organizations (the client) and the built-environment professionals (internal engineers, consultants and the client's agents) should also be noted.

A study done by Faridi and El-Sayegh (2006) in the United Arab Emirates (UAE) shows that shortage of skilled labour, poor supervision and site management, inadequate leadership

and equipment failure have contributed to delays in construction projects. Alkass *et al.* (1996) attribute delays to strikes, project rework, poor organisation, material and equipment shortage or failure, change of scope, natural events, contractor's failure to provide sufficient manpower, and denial of access to site by the client after site handover has been carried out.

Faridi and El-Sayegh (2006) found that the most prevalent causes of project delays as ranked by consultants and contractors in the UAE are inadequate early planning of projects, preparation and approval of drawings, poor supervision and site management, and shortage of manpower. The lowest ranking causes from the same study were found to be shortage or delays in delivery of materials, poor leadership of the construction manager or project manager, incomplete drawings, specifications or documents and productivity of manpower. Similar studies were done by Assaf, Al-Khalil and Al-Hazmi (1995), and Mezher and Tawil (1998) in Saudi Arabia and Lebanon, respectively. Assaf *et al.* (1995) found that the top ranking causes of project delays are preparation and approval of drawings, financing by contractor during construction and shortage of manpower, while the lowest ranking one was productivity of manpower. According to Mezher and Tawil (1998) the most common causes of project delays include poor leadership of construction or project manager, and preparation and approval of drawings. The study also found that the lowest ranking cause of delays is shortage of manpower.

Shortage and low productivity of manpower, and other non-excusable causes of delays may be more prominent in the construction industry due to the hypothesis that emerging contractors are generally low skilled and somewhat incompetent.

Assaf *et al.* (1995) concluded that project delays in the construction industry are closely related to availability and productivity of manpower which are linked to skills and competencies of contractors. Skills and competencies in the construction industry place contractors in a better position for getting work and, as a result, experience. This supports the research statement that states that contractor performance in South Africa is linked to skills, competencies and experience.

Table 2.4 is a summary of the types and causes of delay with the corresponding responsible project stakeholders as compiled by author from the findings by Assaf *et al.* (1995).

Table 2.4 Relationship between project delays and compensation

Causes of delay	**Responsible party**	**Classification**	**Contractor's compensation**
Late payment	Client	Excusable compensable	Extension of time and monetary compensation
Denied access to site	Client	Excusable compensable	Extension of time and monetary compensation
Change of scope or project rework	Client or client's agent	Excusable compensable	Extension of time and monetary compensation
Strikes due to late payment of labour	Contractor	Inexcusable	Penalties
Shortage of skilled labour	Contractor	Excusable non-compensable	Extension of time
Failure to provide sufficient manpower	Contractor	Inexcusable	Penalties
Unprovoked strikes	None	Excusable non-compensable	Extension of time
Equipment shortage or failure	Contractor	Inexcusable	Penalties
Natural events (e.g. rain)	None	Excusable non-compensable	Extension of time

Project delays can lead to cost overruns (Sambasivan and Yau, 2007), low productivity, contract termination (Arditi and Pattanakitchamroon, 2006) and hinder business development for the contractor (Benson, 2006). According to Arditi, Akan and Gurdamar (1985) and Lo, Fung and Tung (2006) project delays can lead to slow economic growth since, according to Adnan, Hashim, Yusuwan and Ahmad (2012), the construction industry plays a major role in infrastructure development and, therefore, the growth of the economy.

2.5.4 The tendering process

Most clients regard cost as the most important criteria for selection and appointment of contractors and are interested in the lowest bidder (Tao and Kumaraswmay, 2012; Marzouk, El Kherbawy and Khalifa, 2013). However, merely choosing the lowest tender price has been found to lead to issues such as cost overruns, low quality and delays (Sweis *et al.*, 2014). This has also led to contractors 'under-quoting' in order to be competitive and achieve the lowest price, which lowers their profit margins and, as a result, their performance on a business level. The standard evaluation criteria for tender evaluation from the Mpumalanga government institution that is under study were evaluated. The criteria are standard and primarily involve two stages; pre-qualification and preference. The pre-qualification stage generally involves the following:

- Contractor's assets (infrastructure and equipment)
- Understanding the scope of works
- Contractor's staff profile
- Contractor's experience in the industry
- Contractor's financial capability

The second stage (preference scoring) allocates points to contractors according to price and Broad-Based Black Economic Empowerment (B-BBEE) status level of contributor. The lowest priced tender is usually used as benchmark to award pricing points to the other bids. The pricing points along with the B-BBEE points are used to calculate the final score. A standardised preference point system is used giving weightings for each of the types points. For tenders less than R1 000 000.00, an 80/20 system is used where 80% is price points and 20% is B-BBEE points. A point system of 90/10 is used for tenders that exceed the value of R1 000 000.00; 90% is price points and 10% is B-BBEE points. Appendix D is an extract from the tender document and shows the tender evaluation criteria under discussion.

It is worth noting that the evaluation process does not consider the contractor's technical competence in relation to qualifications. Although experience, which is another measure of competence, is evaluated, it does not have enough weighting to form part of the final decision. This may lead to contractors with very little or irrelevant experience being appointed on the lowest tender price and highest B-BBEE point basis. The result of this may be appointing an incompetent contractor who would then perform poorly.

Jiang, Chen and Shu (2011) propose that technical competence should be used for final selection of contractors when awarding tenders (see Figure 2.1).

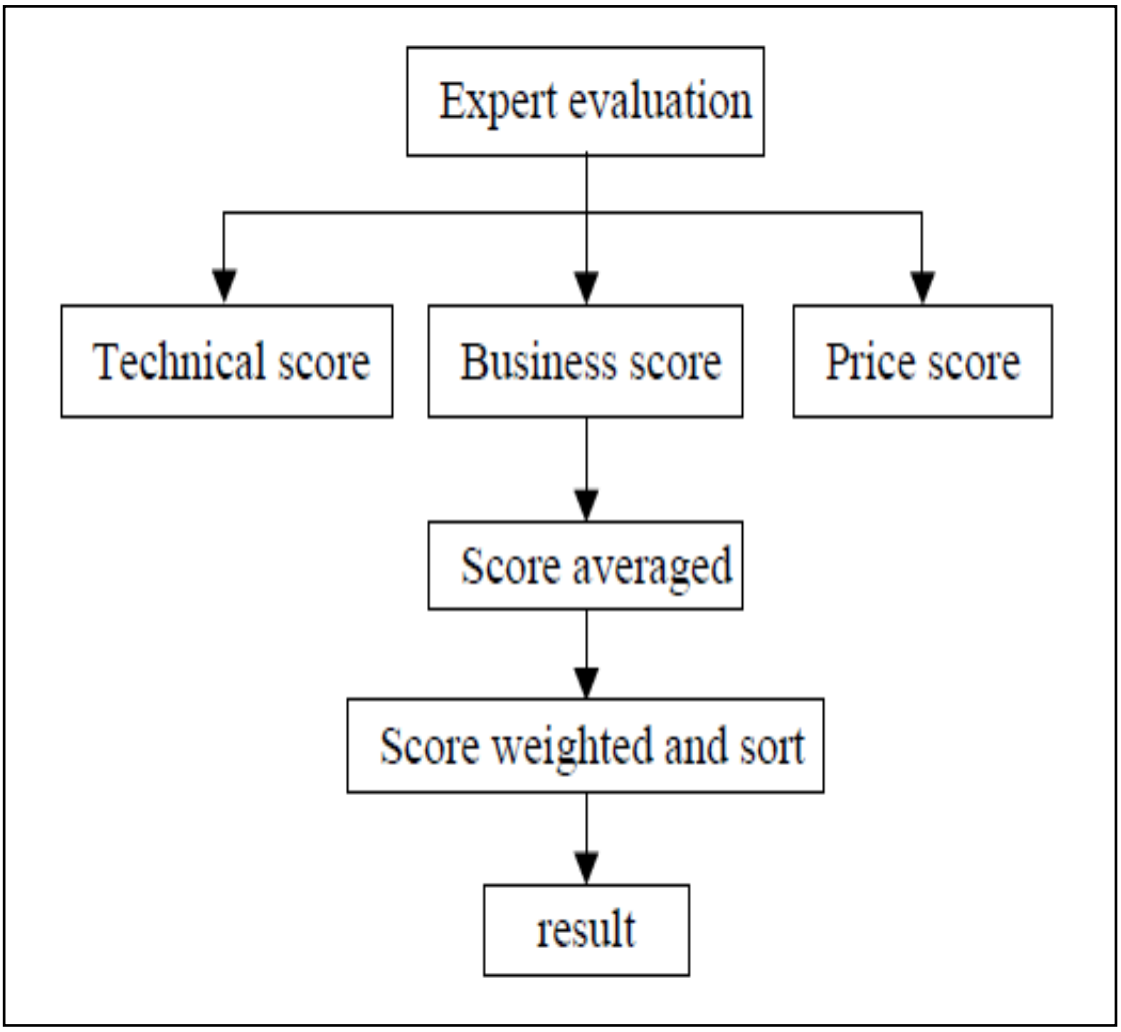


Figure 2.1 Tender evaluation process (**Source:** Jiang *et al*., 2011)

The tendering process, primarily favours the appointment of emerging contractors, as defined in this report. However, this bias does not benefit these emerging contractors on a project level. The appointment of contractors with no project competence is 'setting them up for failure' and hinders their development on a business level. Criteria for evaluating the technical competence of contractors; qualifications and experience, should be incorporated into the final scoring of tenders and should form part of the deciding factor. In addition, emerging contractors have insufficient understanding of the contract documentation and the submission of the tender documents (Croswell and McCutcheon, 2001).

2.5.5 Emerging contractor development programmes

The South African government in collaboration with the CIDB has developed frameworks that aid the development and support of emerging contractors. These interventions include the Emerging Contractor Development Programme (ECDP) and the National Contractor Development Programme (NCDP).

The objective of the ECDP (2005) is to tackle the problems facing emerging contractors in South Africa. These problems include access to financial resources, late payments by clients (mainly state organisations), poor marketing, difficulty of entry into the industry, and irregularity of projects (ECDP, 2005). From the above list it can be said that the ECDP does not take into consideration the contractors' qualifications and experience in the construction industry and, therefore, contractor competence.

There have been doubts that the development programmes aimed at developing emerging contractor companies have actually managed to turn them into 'serious industry players' (Martin and Root, 2012). The CIDB, in the NCDP framework, defines "contractor development" as:

> *A deliberate and managed process to achieve targeted developmental outcomes the improves contractor grading status, performance and quality, and equity and targeted ownership* (CIDB, 2011b).

This definition does not explicitly place importance in the development of contractor competence in the construction industry in relation to factors such as technical qualifications, knowledge and experience. This report, therefore, studied the objectives of the NCDP in order to test the claim by Martin and Root (2012). It was found that three of the primary objectives of the NCDP were to improve emerging contractor performance through skills development, improve business management and improve technical skills of the contractors (CIDB, 2011b). These objectives are based on the key principles on which the NCDP is based. Under the key principles it is stated that contractors are to enter into the programme and receive support in relations to skills, qualifications, certifications, sustainability and quality (CIDB, 2011b). This is found to be contradictory to the previous claim by Martin and Root (2012) since the key principles and objectives of the NCDP are to

develop emerging contractor competence and equip them to conduct their businesses in a sustainable manner.

On the other hand, it has been reported that the overall success of the contractor development programmes has been rather questionable (CIDB, 2009). There has also been difficulty in obtaining reliable information on the growth and performance of contractors that have participated in contractor development programmes (CIDB, 2009). This is in support of the notion posed by Martin and Root (2012) that the contractor development programmes have not managed to develop competent contractor who will have a major contribution to the construction industry. There is a need for contractor development programmes to be CIDB grade specific in order to address the needs and limitations that are directly related to level of development of the contracting businesses. Monitoring of the contractors participating in the development programmes should be on a project basis in order to collect reliable information on the performance and competence of the contractors.

2.5.6 Unethical conduct

According to Transparency International (2005) the construction industry is highly fraudulent globally and provides a favourable environment for improper ethical conduct. These unethical issues can occur at any stage of the project cycle; during planning and design, pre-qualification and tendering process, and project implementation, operation and maintenance (Adnan *et al.*, 2012). Adnan *et al.* (2012) argue that contractors may not be the only stakeholders who are responsible for the unethical conduct in the construction industry and, although often forgotten and not reported, clients and technical consultants may be a contributory factor. Government officials are perceived to be actively involved in corruption in the form of accepting bribes and tender manipulation (Bowen, Edwards and Cattell, 2012).

Unethical practices in construction projects can result in a number of issues such as cost overruns and time delays (Abdul-Rahman *et al.*, 2008) and the consequences may include economic, financial and reputational damage for the emerging contractor (Adnan *et al.*, 2012). Corruption which was found to be one of the problems in the construction industry can result in up to 25% of cost overruns in the public sector (Transparency International, 2005). Transparency International (2005) adds that this may result in wasted public

resources, missed infrastructure development opportunities and an unstable environment for small businesses. It has undesirable impacts on the achievement of South Africa's sustainable development (Pillay, 2004).

2.6 SUMMARY OF LITERATURE REVIEW

It is clear from literature that emerging contractors in the construction industry face a number of issues that affect their performance. The most prevalent issues were found to be financial, project and business management with little emphasis on technical qualifications and experience. Literature also shows that project performance is related to the actions or inactions of all stakeholders in a project, which are the contractor, the client, the sponsor, the engineer and, in the case of public sector projects, the beneficiaries. This report focuses on the performance factors that can be attributed to the contractor. Figure 2.2 (developed by author) is model that was developed in this research report and demonstrates the relationship between contractor performance, development, skills, qualifications and experience as indicated in the research statements.

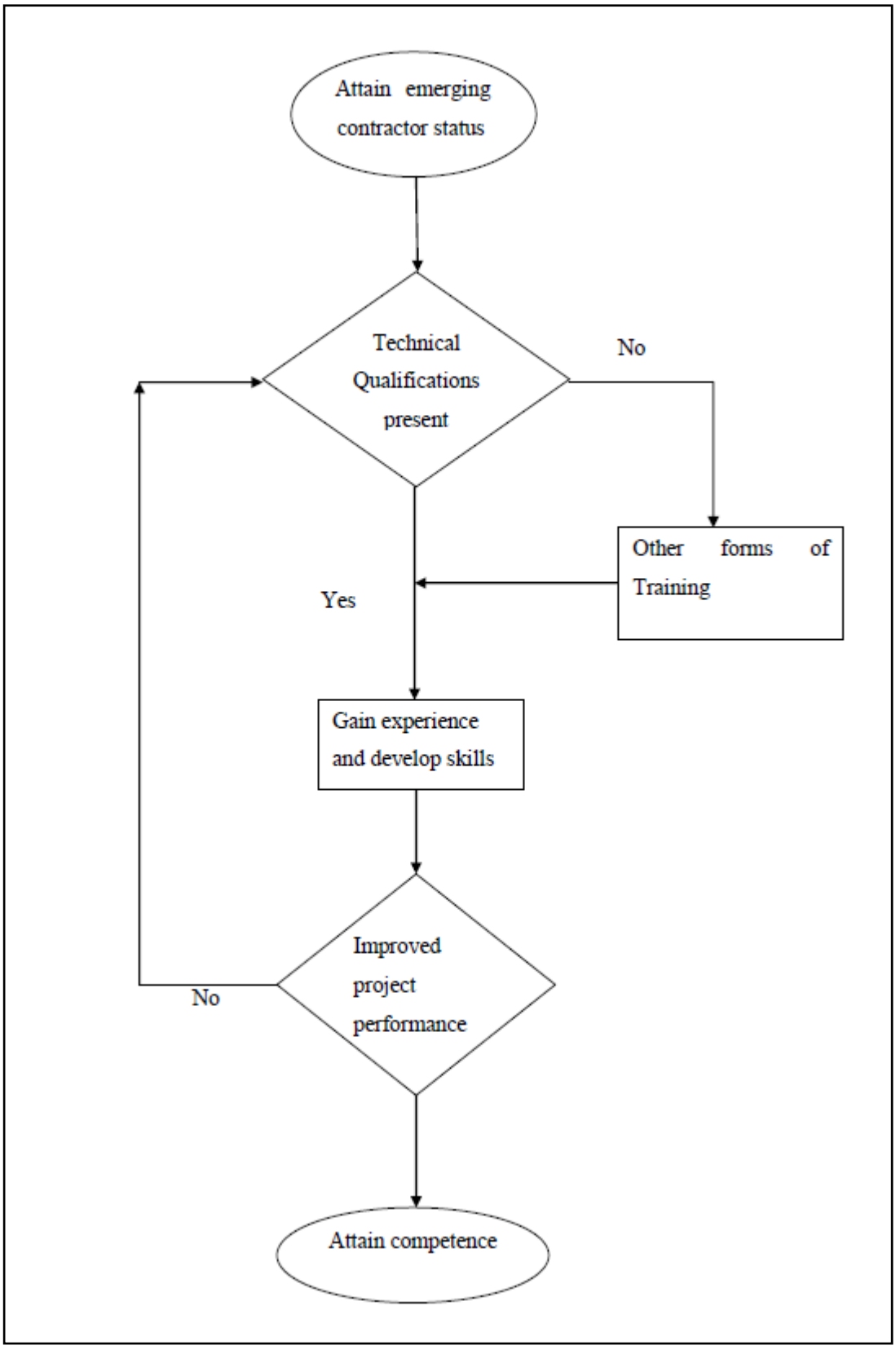


Figure 2.2 Emerging contractor development model

This model is based on the notion that the skills and knowledge required for the construction industry can be gained from formal qualifications from higher institutions. It is also noted that other forms of training other than tertiary qualifications can develop skills. Experience is then gained from application of the skills and knowledge gained through the various forms of training. The qualifications, skills and experience would then develop competence and aid better project performance. This is also supported by the insinuation by Croswell and McCutcheon (2001) that lack of practice may result in loss of competence. Practice may be viewed as the application of the acquired skills, knowledge and experience.

CHAPTER 3: METHODOLOGY

It can be argued from the studies that have been conducted around the subject of emerging contractor performance that very little work has been done to find out whether there is a correlation between contractors' project performance, contractor experience and technical qualifications. This investigation was aimed at finding the relationship between emerging contractors' project performance in public sector projects and, their qualifications and experience.

A literature review was done in order to clearly state and substantiate the problem which is that there is generally low performance of emerging contractors in the public sector (Zulu and Chileshe, 2010). The literature review was used to determine the causes of low performance or failure of emerging contractors in government infrastructure projects. The body of knowledge helped to define "emerging contractor" and "performance" and this helped to determine the gaps in literature, the types of questions not addressed by literature and the type of empirical data that was collected in order to address the unanswered questions.

A positivist philosophy was used for this research and focused on the factors of failure and success of emerging contractors in government infrastructure projects in the South African construction industry. The study was based on facts from the body of knowledge and from the empirical data that was collected. The research statements propose that project performance is related to technical qualifications and experience prior to a particular project.

A qualitative approach was used for the collection of data in order to study the indicators of performance and factors affecting performance of emerging contractors in government infrastructure projects. "Qualitative data sources include observation and participant observation (fieldwork), interviews and questionnaires, documents and texts, and the researcher's impressions and reactions" (Myers and Avison, 1997).

A literature study was used as the first part of the qualitative data in order to achieve the following objectives:

- Determine the key factors of contractor performance in the construction industry.
- To demonstrate the relevance of the topic in this area of study and to show how this research relates to previous work done.
- To support and justify various arguments in the study such as contractor performance being measured against timely completion of projects.
- To determine the strengths of previous research and any gaps or limitations that may need to be addressed or supported by empirical data.

Project information pertaining to the measures and/or indicators of performance in relation to the contractors was collected and analysed in order to test the research statements and address any limitations in literature. The empirical data was also used to confirm and support the literature study. The time taken to complete the projects was also analysed. A comparison was then done between contractors with shorter or no delays to those with significantly longer delays. It was expected that contractors with relevant construction experience and technical qualifications would experience shorter or no delays in projects and contractors with no experience and technical qualifications would show a low performance when measured against the time factor. The results were then analysed in order to develop recommendations to address the problem that seems to be plaguing the South African construction industry especially in the public sector or government infrastructure projects.

The empirical data and results were represented both quantitatively and qualitatively for analysis, drawing of conclusion and formulation of recommendations.

Figure 3.1 shows the methodology followed for the research from literature survey to the finalisation of the research report.

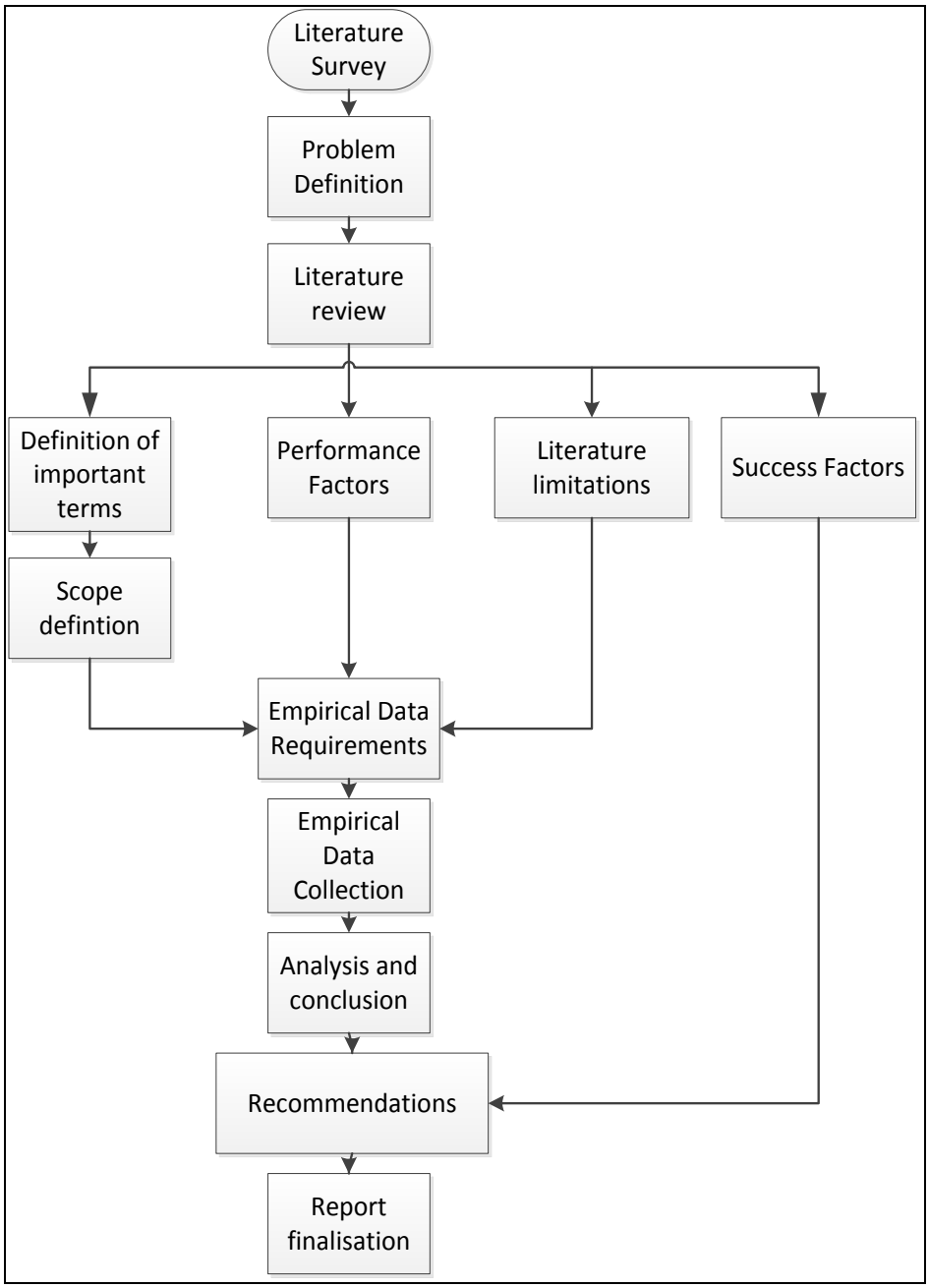


Figure 3.1 Methodology and process diagram

3.1 RESEARCH EXECUTION PLAN

The research execution plan has been divided into two blocks with block one following block two, demonstrating the sequence of the plan.

Block 1:

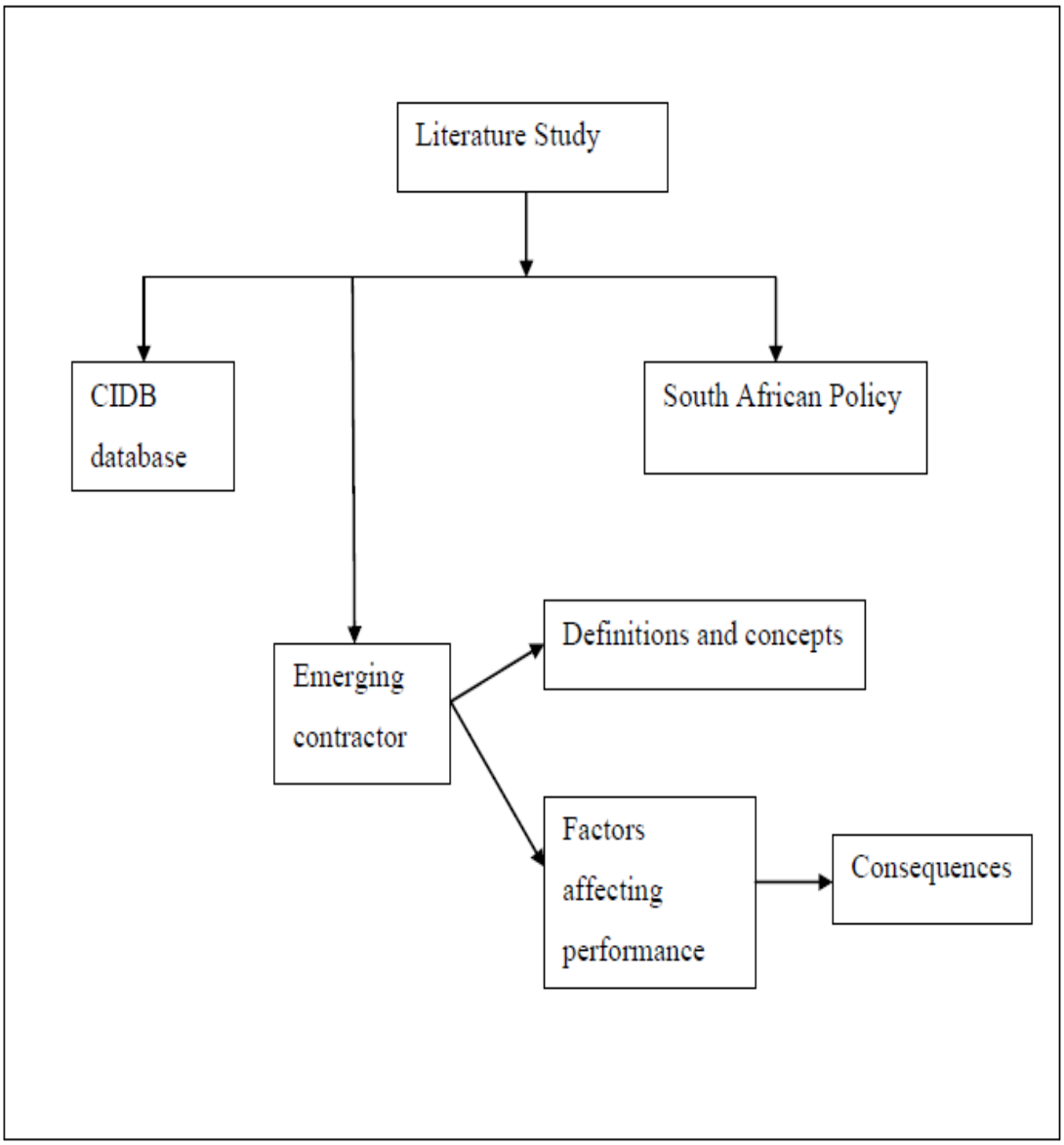


Figure 3.2 Block 1 of the research execution plan

Block 2:

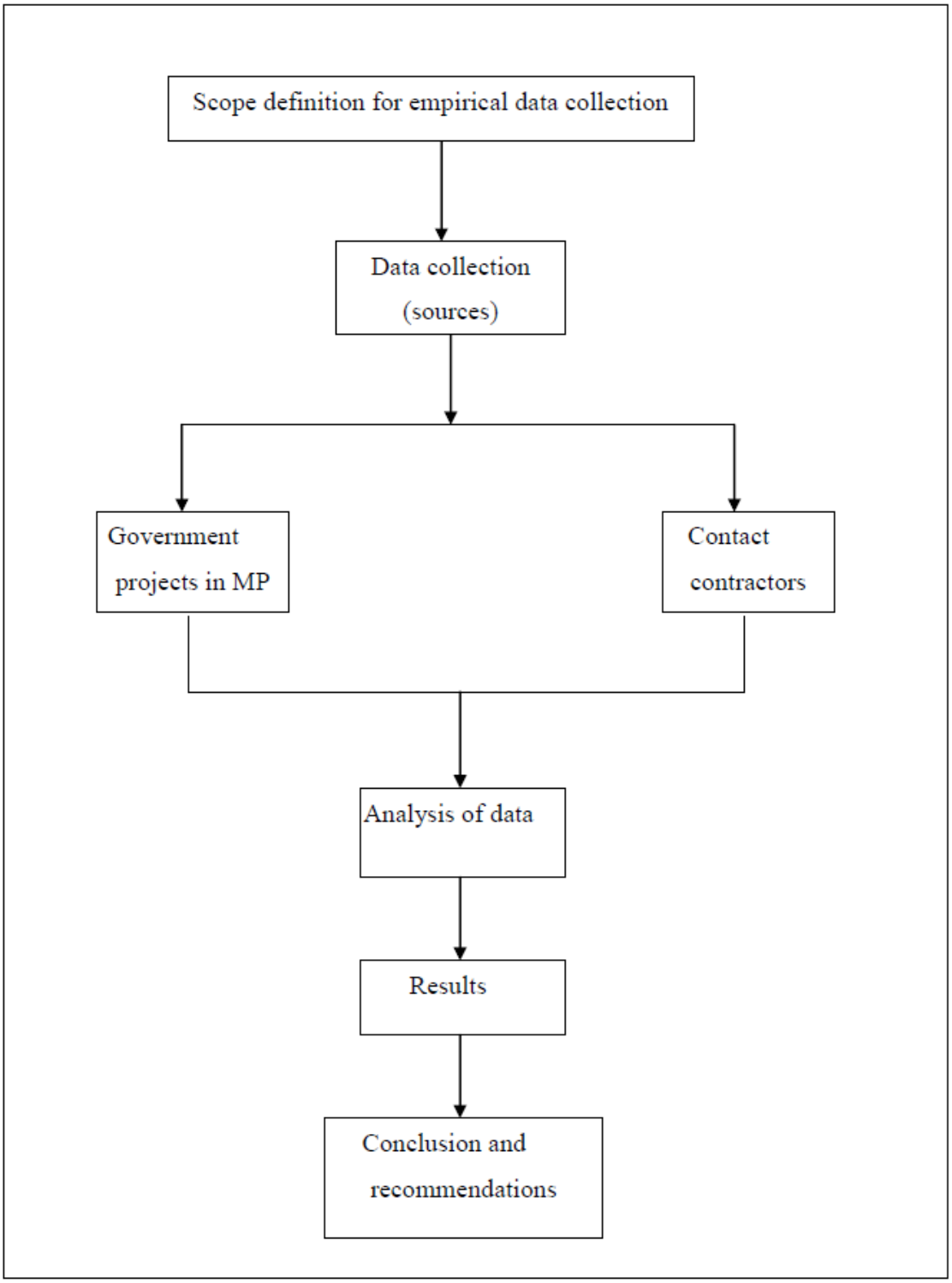


Figure 3.2 Block 2 of the research execution plan

3.2 EQUIPMENT AND RESOURCES

This section highlights the resources used for the completion of the research. Included is the empirical data collected along with their respective sources.

3.2.1 Data collection

The data was collected from a state organ in the Mpumalanga Province and from emerging contractors that have been appointed as per the state organ's database. The CIDB database was also used as a resource to support the empirical data. The data was collected in two parts and contained the following:

Part 1:

- Completion certificates
- Tender documents
- Payment certificates
- Appointment letters
- Contractor contact details

Part 2:

- Contractors' company profile reflecting projects undertaken (i.e. experience or track-record)
- Contractor CIDB grading
- Contactors' Curriculum Vitae (i.e. evidence of qualifications)

Part 1 of the empirical data was collected from the database of one of the government organizations in the Mpumalanga Province that run projects which require the appointment of CE and GB type of work (i.e. as per delineation). The data collected in Part 1 was also used to quantitatively represent and analyse the performance indicators.

The contact information gathered from Part 1 was used to contact the contractors in order to gather Part 2 of the data. Part 2 of the empirical data was then used to confirm what was proposed in the research statements (i.e. determine whether or not there is a relationship between project performance and experience and technical qualification).

3.2.2 Reliability and validity

This section highlights how the factors of reliability and validity of the research and the research instrument (methodology) were taken into consideration.

3.2.2.1 Reliability

Golafshani (2003) and Nemaenzhe (2010) describe reliability as a measure of whether or not the result of the research is replicable or reproducible. Joppe (2000) further defines reliability as "the extent to which results are consistent over time and an accurate representation of the total population under study and if the results of a study can be reproduced under a similar methodology".

This research was based on empirical data that was collected from various sources (a state organ in MP and contractors). The empirical data that was collected was used for tendering and formed part of a 'trusted' database. It can be said that with a different sample and a different area; if the same information was collected for the same evaluation, the same result would be reached. It can be said that this research and the methodology used was, therefore, reliable as defined above.

3.2.2.2 Validity

According to Hignett (2005) internal validity covers the "credibility" and "trustworthiness" of the research and describes external validity as "generalisability and transferability". According to Joppe (2000) validity is a measure of how truthful the research results are or if the research instrument measured what it was intended to measure.

When considering the definition put forward by Joppe (2000), it can be said that the research instrument was somewhat internally valid as the empirical data that was collected was used to measure the correlation between project performance and technical qualifications and experience, which was achieved (see Chapter 4 and Chapter 5).

However, the result may not necessarily be externally valid as the size of the sample was small. Only 30 projects were evaluated, some of which were conducted by the same contractors, and only concentrated on one government organisation in on province,

Mpumalanga Province of South Africa. Since the sample size is rather small, it can be said, therefore, that the results are not generalizable. In order to achieve generalisability for the South African construction industry, a bigger sample must be used over the country.

3.2.3 Ethical considerations

For the sake of confidentiality purposes of both the contractors and the state organ used for the study; the name of the government organisation, the projects and their beneficiaries, the contractors' names or company names and the contactors' contact details were not included on the report. This information was used solely for the analysis and that was communicated to all parties involved.

CHAPTER 4: RESULTS AND ANALYSIS

4.1 DESCRIPTION OF DATA

Contractors from the Mpumalanga Province were selected as a case study for this research. Data on a total of thirty (30) projects was collected as per data collection Part 1 in section 3.2.1 of Chapter 3 from a government department in the province. The projects in the case study were initiated between 2011 and 2013, and were completed between 2013 and 2014. The data from the government department represented a total of twenty-five (25) contractors who were then contacted for Part 2 of the data collection as per section 3.2.1 of Chapter 3. A standard email was sent to the 25 contractors requesting their company profiles and Curriculum Vitaes (CVs) of the core staff of the company (mainly the owner). See Appendix E for the contents of the email. Contact details, CIDB grades, payment and completion certificates, and project start and completion dates were collected for all 30 projects. Therefore, 100% of Part 1 of data collection was collected. After all 25 of the contractors were contacted for CVs and company profiles, the respondents accounted for 64% of the 30 projects.

4.2 CONTRACTOR PROFILE

Figure 4.1 shows the proportion of female owned to black owned companies as a percentage of the total (25) contractors.

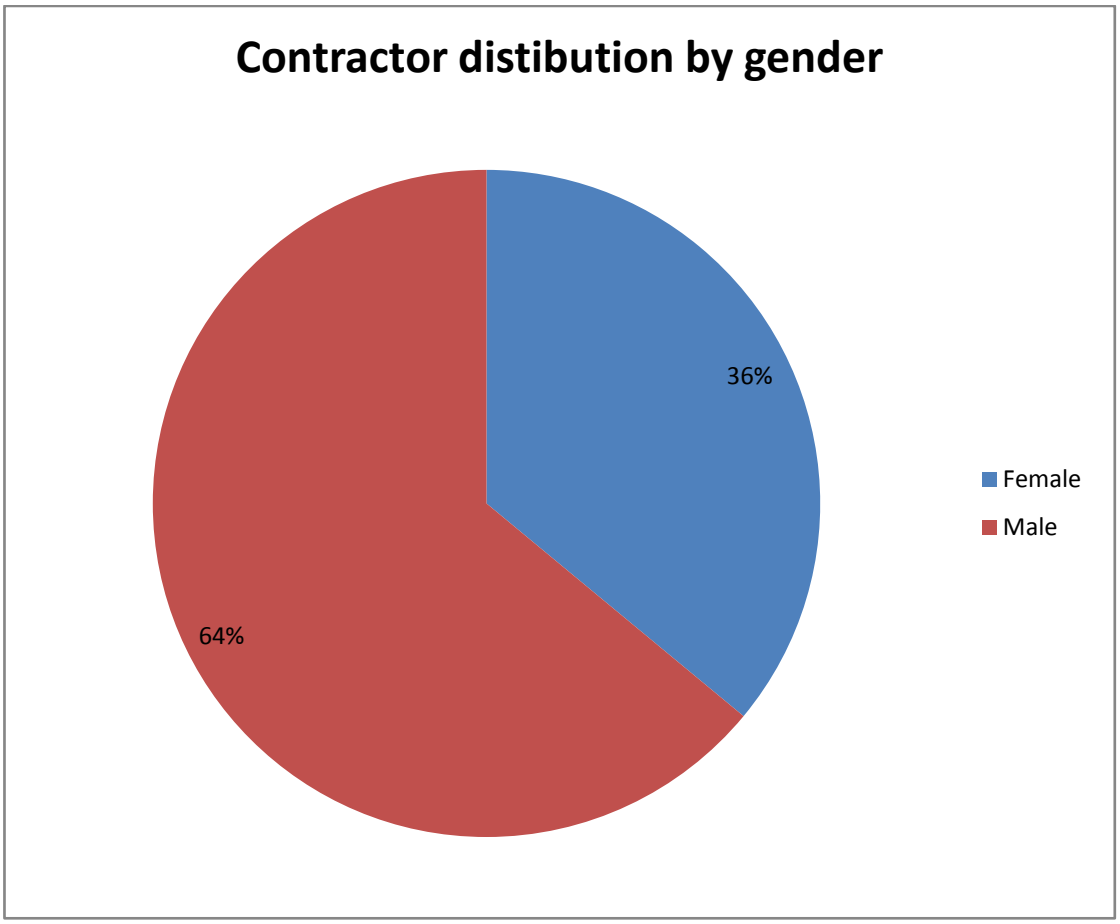


Figure 4.1 Contractor distribution by gender

The contractors that are awarded tenders or bids by the Mpumalanga government department under study are predominantly male owned enterprises. This is consistent with the general notion that the construction industry is a male dominated sector.

Figure 4.2 shows the proportions of female owned to male owned companies as a percentage of the respondents who accounted for 64% of the 30 projects under study.

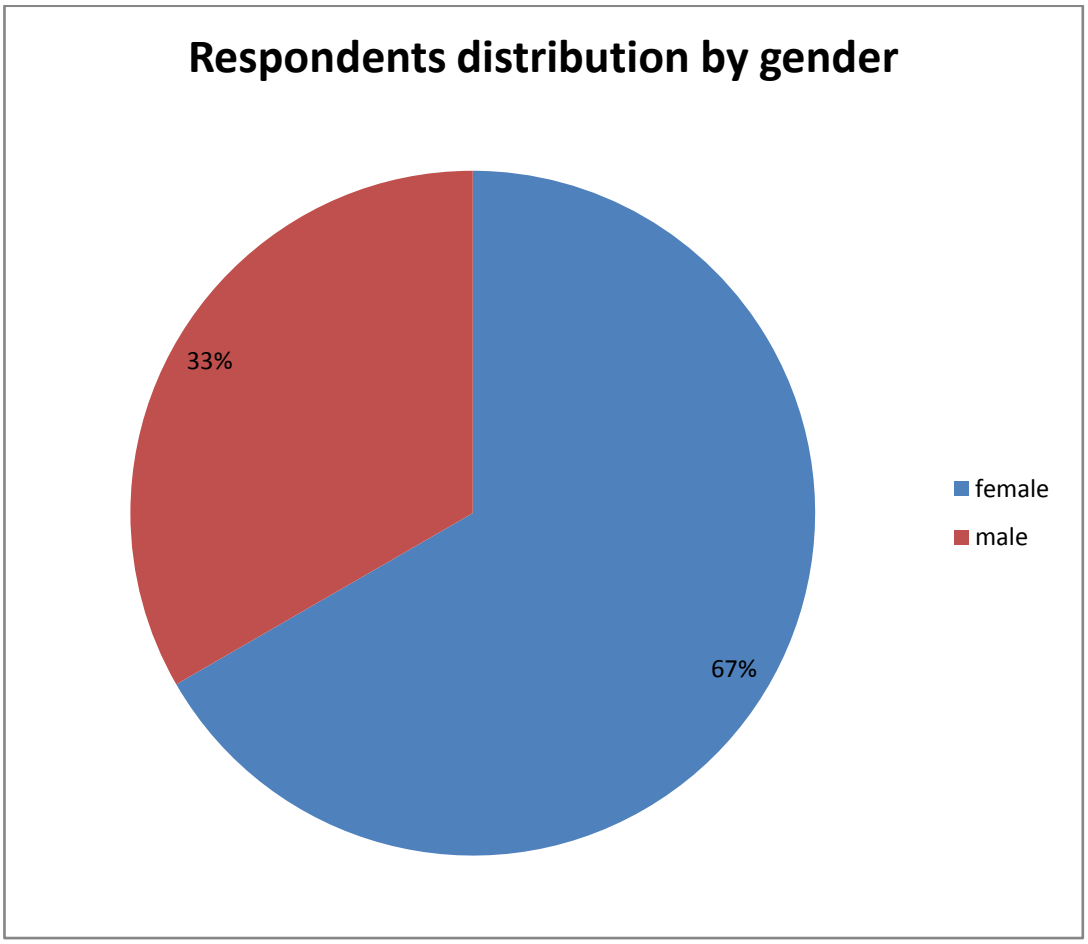


Figure 4.2 Respondents distribution by gender

Figure 4.3 shows the percentages of contractors in the sample that are register under the CE category of works along with their respective grades.

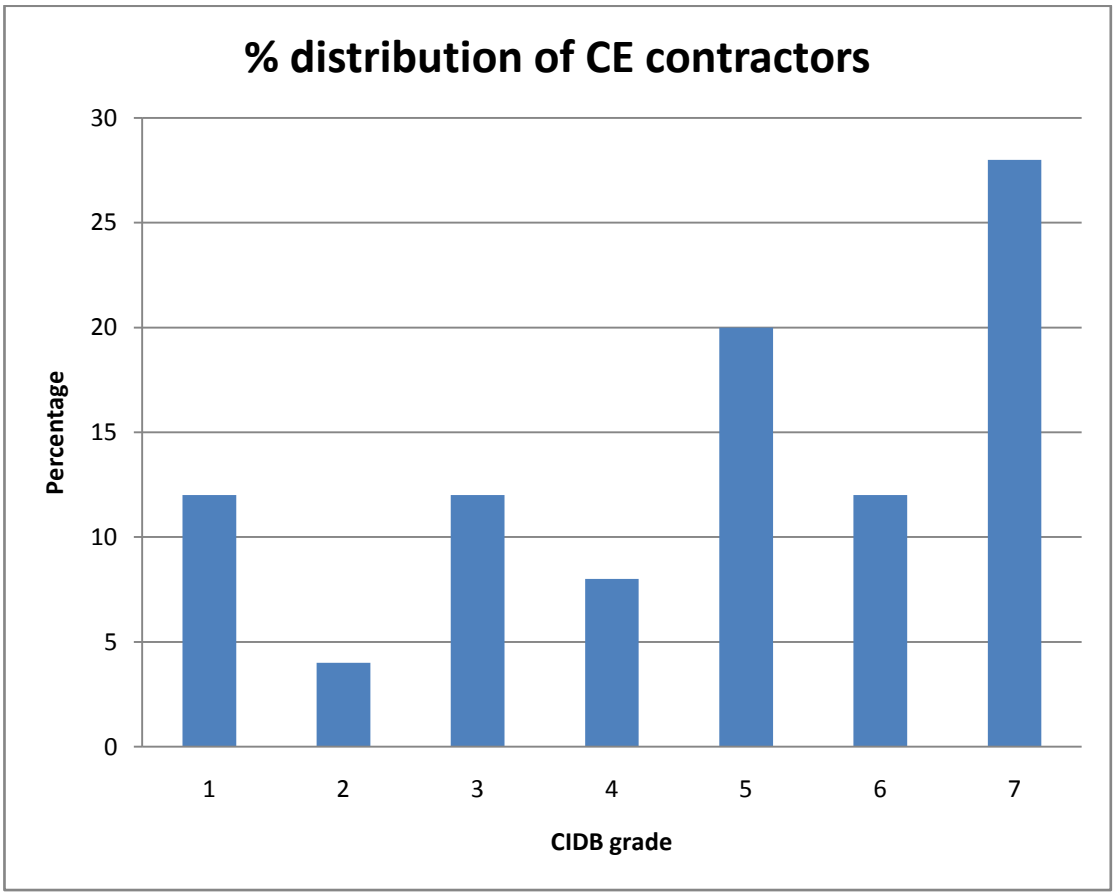


Figure 4.3 Distribution of CE contractors by grading

It is interesting to see that, from Figure 4.3, most contractors in the CE category are between CIDB grades 5 and 7. It can be argued that a higher CIDB grading may be a reflection of business growth. Since a majority of the contractors fall under grades 5, 6, and 7, it would be expected that they have enough experience to perform well.

The GB category shows a slightly different phenomenon (Figure 4.4). A majority of the participants on this category fall under CIDB grades 1, 6 and 7. The high number of grade 1 contractors may be because it is relatively easier to enter into the industry, especially in the GB category, as stated by Jaafar and Abdul-Aziz (2005).

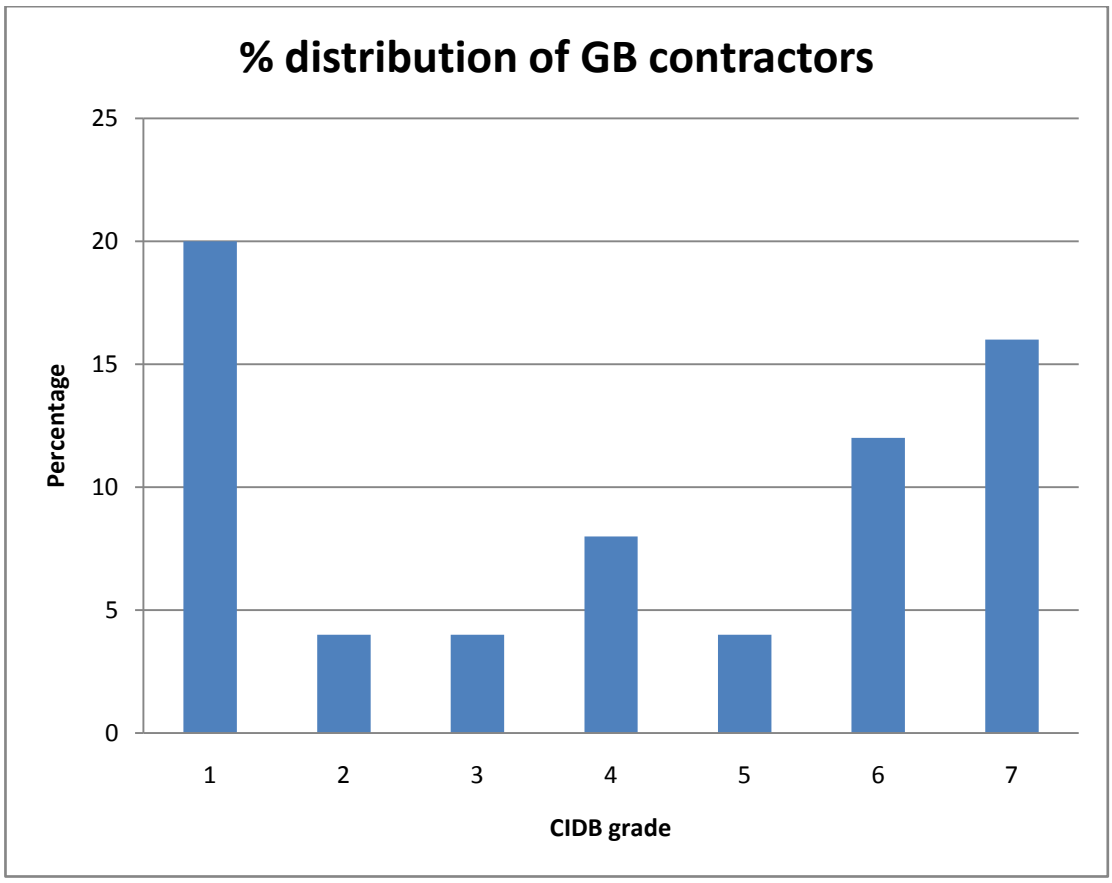


Figure 4.4 Distribution of GB contractors by grading

4.3 PERFORMANCE INDICATOR

The four most commonly used project performance indicators are time, cost, quality and client satisfaction (Harrison and Lock, 2004; Turner, 1999 and Cheung, Suen and Cheung, 2004). The time factor was used in this research to assess the project performance of emerging contractors in government infrastructure projects. The reasons for the use of time only as a performance indicator are:

- Timely completion of projects is commonly regarded as the major indictor of project success (Rwelamila and Hall, 1995).
- It was found that the internal engineers from the government institution under study conduct quality checks throughout the life cycle of each project. It is, therefore,

assumed that all projects that were completed attained the quality standards and client satisfaction measures.

- The data gathered showed that the government institution under study does not impose penalties that result in financial losses for the contractor and contractors are obligated to complete their work within the tendered amount. Therefore, there are rarely any cost overruns.
- Beneficiaries sign the completion certificate at the end of every project (i.e. at commissioning). The signatories sign as an indication of satisfaction and agreement of all work done by the contractor. For that reason, the presence of a completion certificate usually indicates client (government organisation) and beneficiary satisfaction.

4.4 PROJECT PERFORMANCE

In order to assess project performance, that is the timely completion of projects, the degree of delay was calculated. This provides a uniform measure for performance and allows for comparison of the different contractors and projects with different construction periods. The degree of delay (DoD) is calculated as a percentage over the specified construction period as follows:

$$\text{Degree of delay} = \frac{actual\ \ construction\ \ \ period\ -specified\ \ construction\ \ \ period}{specified\ \ construction\ \ \ period} \times 100$$

$$= \frac{time\ \ overrun}{specified\ \ \ construction\ \ \ period} \times 100$$

For example, the DoD for a 3 month project that took 6 months to complete is:

$$= \frac{6-3}{3} \times 100$$

$$= 100\ \%$$

For projects that were incomplete or had been abandoned at the time of data collection, the delay period and degree of delay are represented by the symbol '∞'.

Table 4.1 shows the 30 projects with the respective construction periods and degrees of delay. The table gives a general idea of project performance in government infrastructure projects.

Table 4.1 Demonstration of project performance in government infrastructure projects

Project	**Contractor**	**Specified Construction Period (months)**	**Actual construction period (months)**	**Time overrun (months)**	**DoD (%)**
1	Contractor 1	4	7	3	133
2	Contractor 2	3	9	6	200
3	Contractor 3	2.5	∞	∞	∞
4	Contractor 4	3	13	10	333
5	Contractor 5	3	6	3	100
6	Contractor 6	4	5	1	25
7	Contractor 7	7	12	5	71
8	Contractor 8	3	∞	∞	∞
9	Contractor 9	1	3	2	200
10	Contractor 10	2	9	7	350

Project	Contractor	Specified Construction Period (months)	Actual construction period (months)	Time overrun (months)	DoD (%)
11	Contractor 11	3	12	9	300
12	Contractor 12	2	4	2	100
13	Contractor 3	2.5	13	10.5	420
14	Contractor 13	0.25	1	0.75	300
15	Contractor 14 JV Contractor 15	4	7	3	75
16	Contractor 16	3	∞	∞	∞
17	Contractor 17	3	4	1	33
18	Contractor 18	3	19	16	533
19	Contractor 19	4	10	6	150
20	Contractor 19	4	6	2	50
21	Contractor 7	3	11	8	267

Project	Contractor	Specified Construction Period (months)	Actual construction period (months)	Time overrun (months)	DoD (%)
22	Contractor 20	3	12	9	300
23	Contractor 21 JV Contractor 22	3	6	3	100
24	Contractor 23	3	∞	∞	∞
25	Contractor 11	3	6	3	100
26	Contractor 7	3	7	4	133
27	Contractor 14 JV Contractor 15	3	6	3	100
28	Contractor 24 JV Contractor 25	3	∞	∞	∞
29	Contractor 21	3	5	2	67
30	Contractor 11	3	5	2	67

It is rather interesting to see from Table 4.1 above that all the projects were delayed. It may, therefore, be concluded that one other factor that affects project performance in terms of the time factor is the specified construction time. The time given to contractors to complete the projects may not be sufficient for the scope of work and needs revision. Specifying construction time is the responsibility of the internal engineers or consultants that are appointed as the agents for the government organisations. However, the mere fact that the

contractors tendered regardless of the time on the tender documents is evidence of lack of knowledge and competence. The submission of a tender document is a legal document which they then agree to by tendering, which the binds them to deliver as tendered.

Figure 4.5 shows that 30% of the projects had a DoD that falls between 51% and 100%. This means that the majority of the contractors went over the specified construction period by up to double the time.

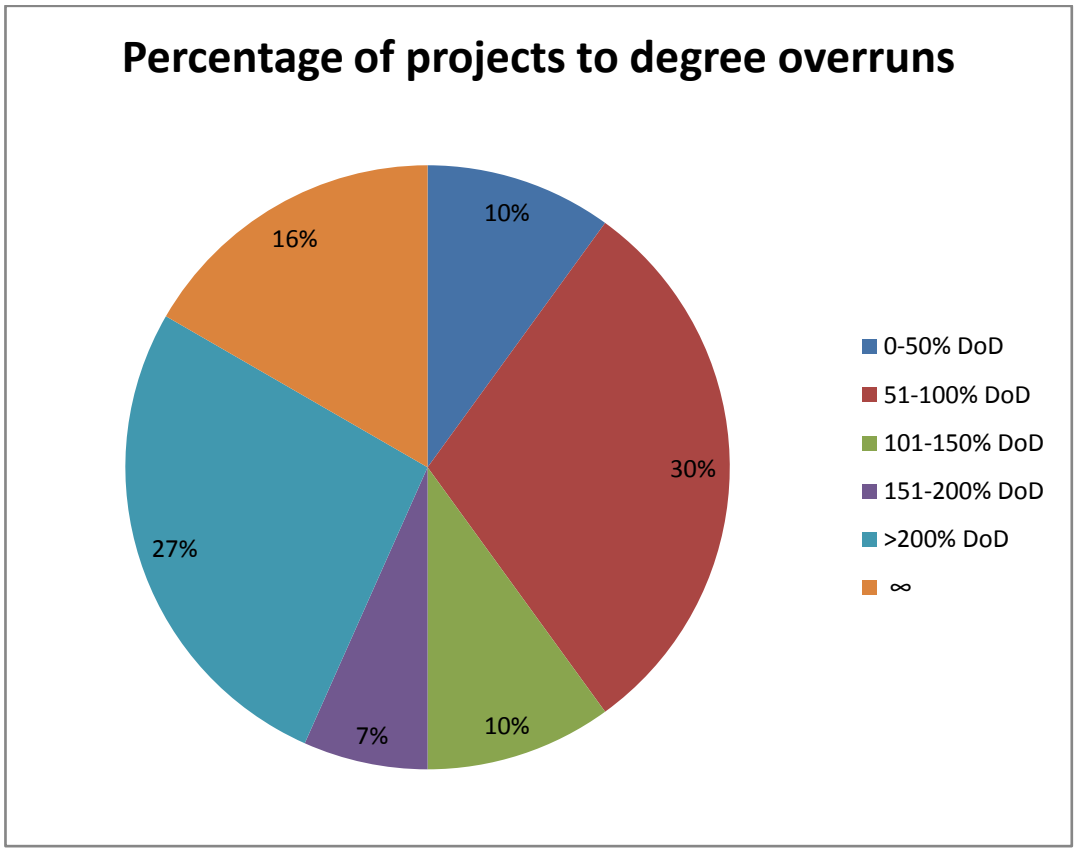


Figure 4.5 Percentage of projects to the corresponding DoD range

The observation that 27% of the projects have a DoD that is over 200% and 16% of the projects do not reach commissioning or close-out stage further proves that project performance in government infrastructure project is cause for concern. This research aimed at exploring and demonstrating the relationship between project performance and the contractors' technical qualifications and experience. Therefore, the projects that have a DoD range of 0-50% need to be studied at great length and compared to the higher DoD projects.

4.5 CONTRACTOR EDUCATIONAL PROFILE

The qualifications were extracted from the CVs that were gathered from the respondents. These are the highest qualifications within the organisation (i.e. the highest qualifications of the core staff).

Figure 4.6 shows the proportions of the qualification bands as the percentage of the respondents.

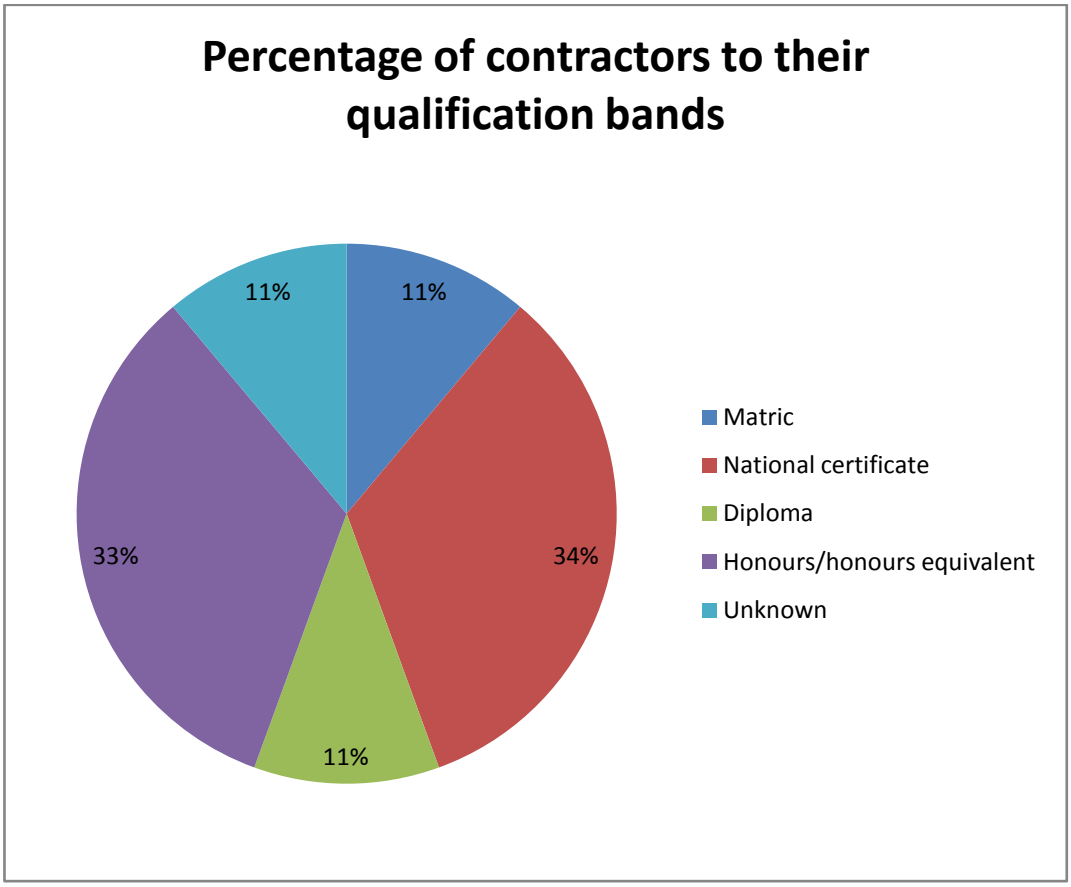


Figure 4.6 Percentage of contractors to their qualification bands

The majority of the contractors (34%) have National Certificate qualifications from institutions such as FET colleges. It was found that some of the respondents had university degrees; interestingly enough, those who went to university either attained diplomas, honours degrees or honours equivalent. This means that none of the respondents attained qualifications between diploma level and honours level. Honours equivalent degrees are four year degrees such as engineering whereby one can continue on from that degree level to a

Masters degree. Therefore, this paper regards engineering degrees attained by the participants as Honours/Honours equivalent.

Figure 4.7 shows the proportion of respondents that have qualifications that are in the technical or construction fields to those with non-technical qualifications.

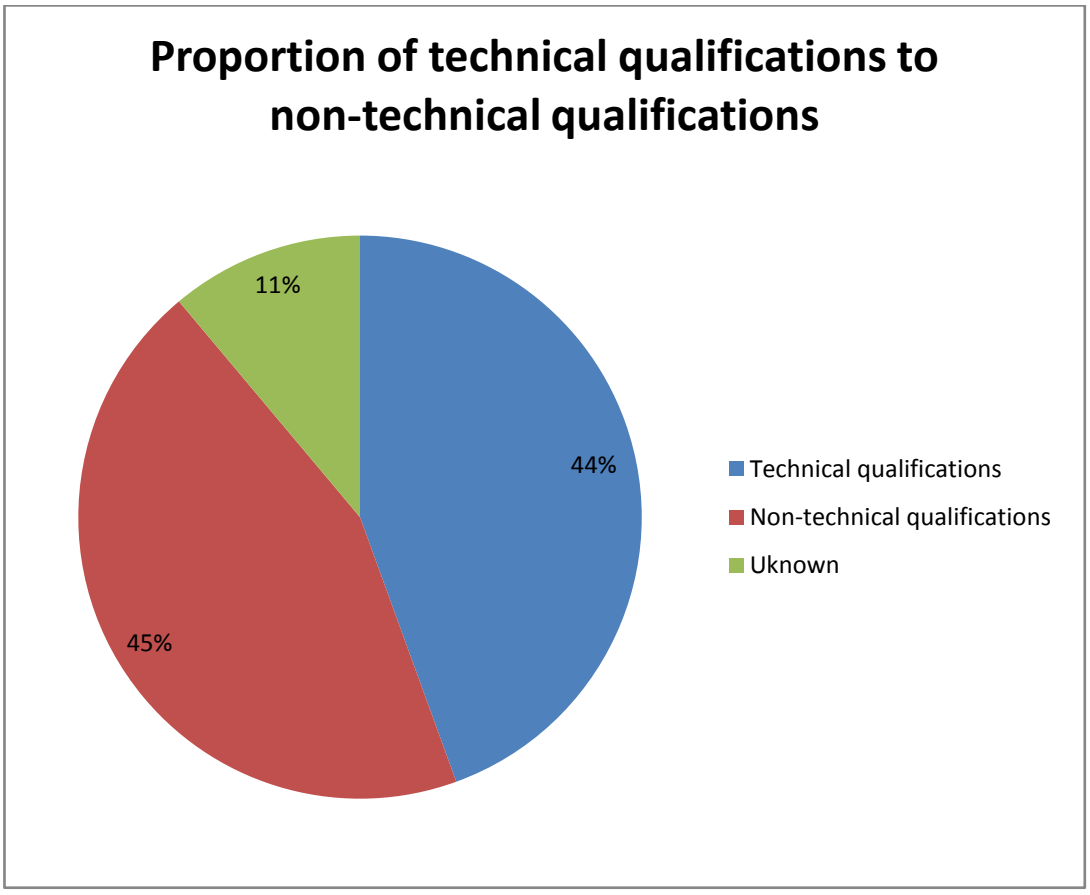


Figure 4.7 Proportion of technical to non-technical qualifications

The qualifications from the CVs received from the respondents were divided into two types; technical and non-technical qualifications. The technical qualifications that were found were in the following fields:

- Civil engineering
- Agricultural engineering
- Quantity survey
- Instrumentation engineering
- Construction

The non-technical and non-construction related qualifications were the following fields:

- Education
- Information technology
- Mobile phone repair
- PC application
- Public relations

4.5.1 Relationship between qualifications and project performance

Further investigation was done to determine the relationship between the types and levels of qualification with project performance. For analysis, the minimum, maximum and average DoD for the different types of qualifications and qualification bands were compared (see Table 4.2).

Table 4.2 Comparison of qualification types and bands by project performance

	TYPE OF QUALIFICATION		**QUALIFICATION BAND**			
DoD (%)	**Technical**	**Non-technical**	**Matric**	**National certificate**	**Diploma**	**Honours/honours equivalent**
Minimum	67	25	420	33	133	25
Maximum	300	∞	∞	300	133	100
Average	134	>170	>210	178	133	68

4.5.1.1 Qualification type and project performance

The results show that projects with the highest DoD and non-complete projects were undertaken by contractors with non-technical qualifications. This supports the research statement that proposes that the possession of technical qualification will result in better project performance when compared to contractors with non-technical qualifications. Figure 4.8 shows that project performance improves with the possession of technical qualifications within the organisation.

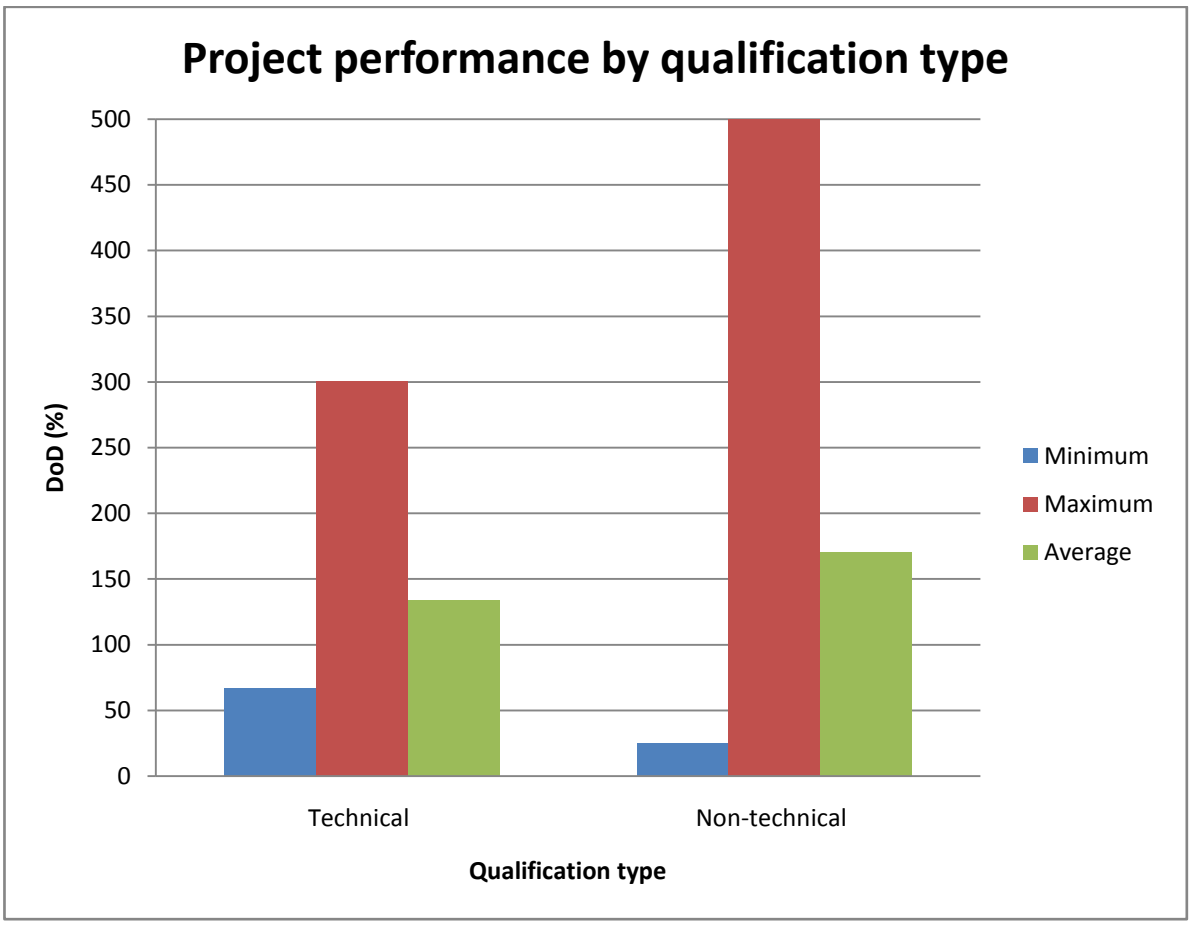


Figure 4.8 Comparison of project performance by qualification types

4.5.1.2 Qualification level and project performance

The results, however, also show that the overall minimum DoD, 25%, is from project 6 which was conducted by Contractor 6 (see Table 4.1). Further investigation showed that Contractor 6 possesses an honours degree; giving evidence that the level of education is also important and is related to project performance. This is further demonstrated by classifying qualifications into bands on Table 4.2. The results show that the lowest qualification level (matric) has the poorest project performance (i.e. highest overall, maximum and average DoD) and the highest qualification level (honours or honours equivalent) shows good project performance (i.e. lowest overall, maximum and overall DoD). The results also show that the DoD decreases as qualification level increases, which shows that project performance improves with the acquisition of higher qualifications (also demonstrated on Figure 4.9).

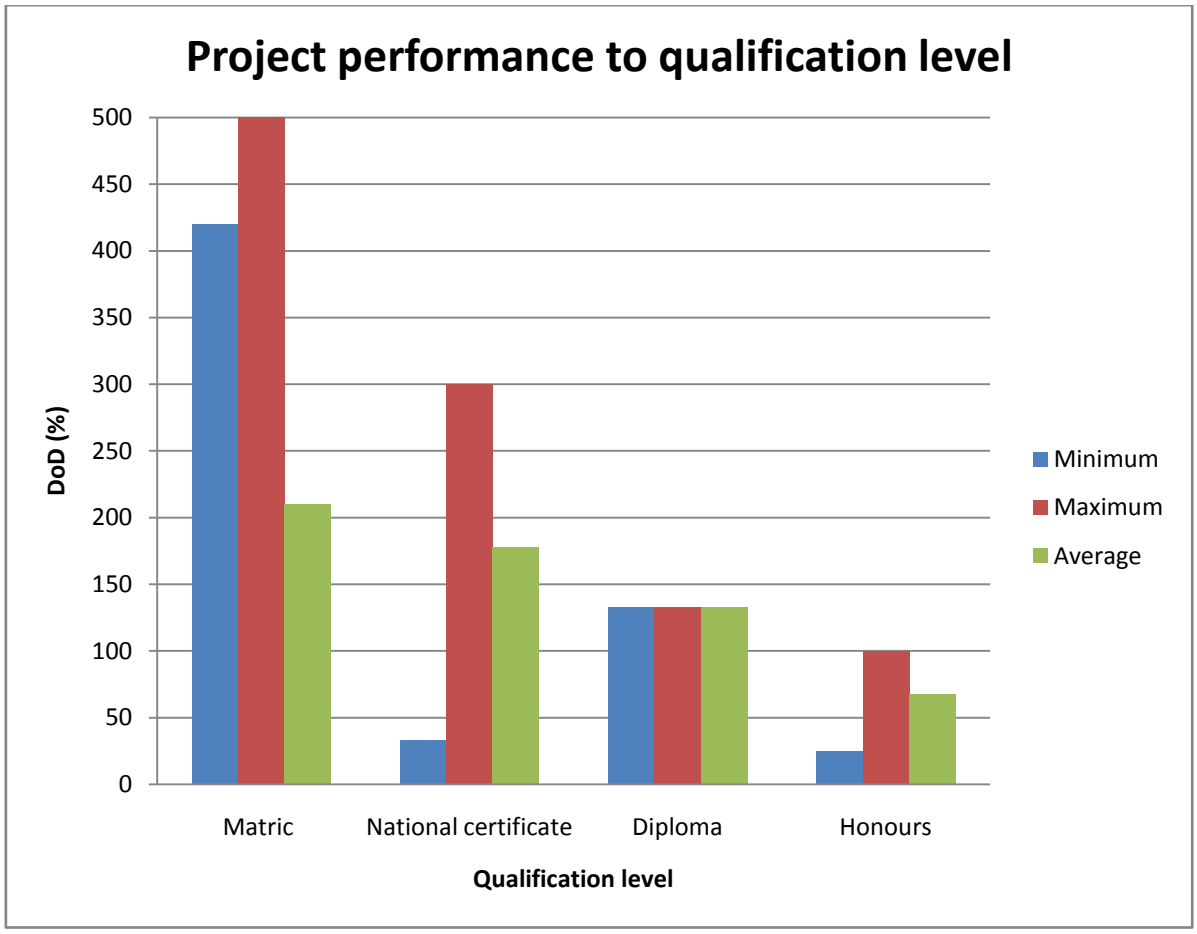


Figure 4.9 Comparison of project performance by qualification bands

The results show that the level of qualification is also essential for project performance. The possession of technical qualifications in the construction industry can be used as a measure or evidence of contractor competence as put forward in Figure 2.1 of Chapter 2. It is worth noting that none of the respondents have any project management qualifications. This may be the other reason for the poor performance of the contractors in all the projects they undertake.

4.6 CONTRACTORS EXPERIENCE PROFILE

The second research statement in this report also proposes that contractor experience also has an effect on project performance. In order to test this research statement, contractor experience was divided into two categories:

- Personal experience of the core staff
- Overall business experience
- Construction companies' years in operation
- CIDB grading

Literature claimed that experience provides competence in the construction industry, even without formal qualifications. The type of experience and the years of experience are also important measures of competence. It is assumed that CIDB grading is a measure of experience since registration and progression from one grade to another require evidence of previous work done as shown in Section 2.2 of Chapter 2. This report, therefore, compares the project performance of contractors by CIDB grades as well. This also supplements the data where contractors' CVs are not available since the CIDB grading of all contractors were collected from the CIDB website.

Figure 4.10 shows the proportion of contractors with staff that have experience in construction related fields to those that do not. The construction related positions that were held by the core staff of the company before establishment or joining of the respective contractor companies were considered. These construction related fields were:

- Civil engineering
- Agricultural engineering
- Site management
- Site supervision

Other contractors and their core staff worked in other fields that are not related to the construction industry, which were found to be:

- Teaching
- Sales
- Administration
- Customer services
- Public relations

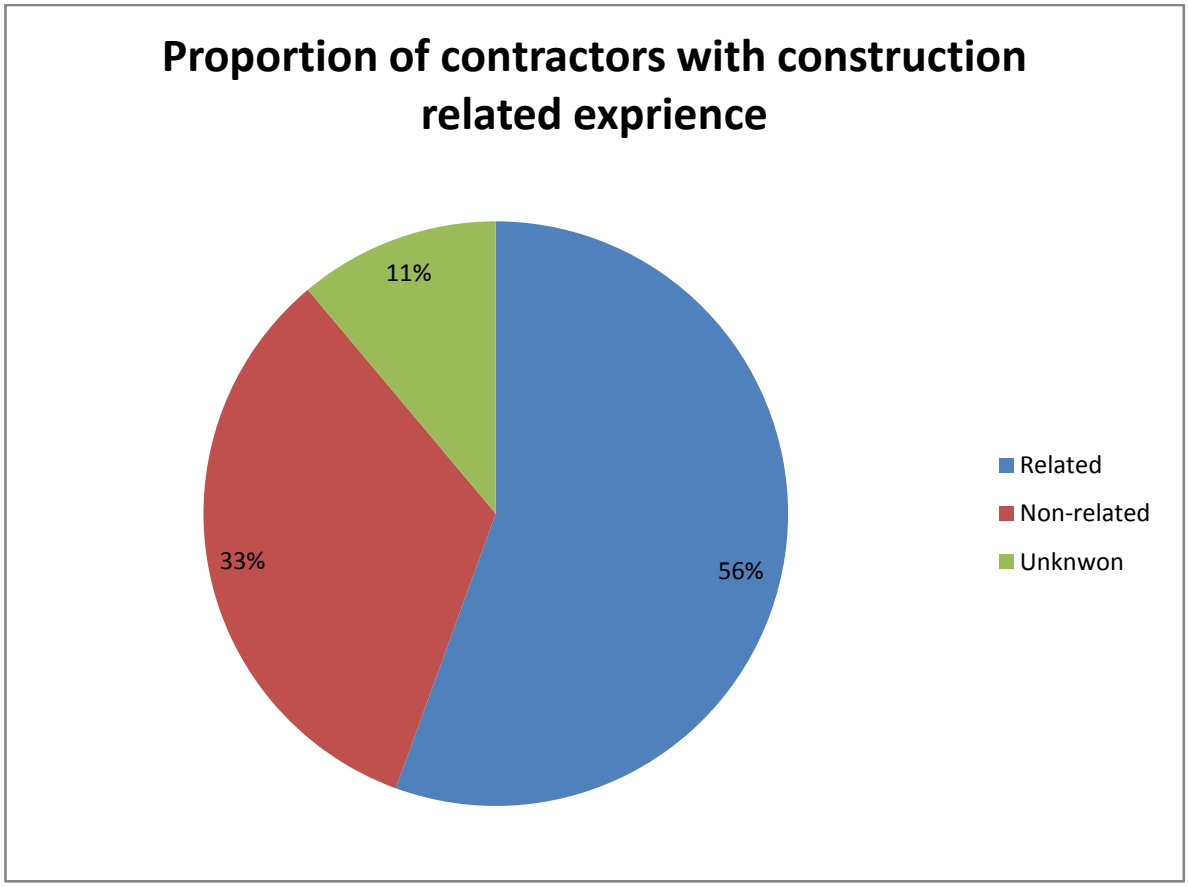


Figure 4.10 Proportion of contractors with construction related experience

4.6.1 Relationship between experience and project performance

4.6.1.1 Personal experience and project performance

It was expected that contractors with a staff complement that has personal experience in the construction industry will generally show good project performance. The results, however, do not reflect that. It is seen from Table 4.3 and Figure 4.11 that contractors with construction related experience generally show poor project performance with the highest overall DoD.

The maximum DoD observed from the contractors with staff that have construction related experience is greater than 500% with some incomplete projects. This is mainly due to Project 3 by Contractor 3. It has previously been shown that Contractor 3 does not have technical qualifications which are necessary for project performance. This may the reason for the poor performance and may mean that technical qualifications are more critical to project performance than personal experience.

Contractors with staff with no construction related experience seem to have achieved the lowest overall DoD. This DoD was from Project 6 conducted by Contractor 6 whose highest qualification level is an Honours degree. This further cements the notion that tertiary qualifications are closely related to project performance. Furthermore, Contractor 6's qualification is not in any of the technical areas identified, showing that the level of qualification is also important. This is also seen from Project 3 where Contractor 3's highest qualification is a matric certificate.

Contractor 3 was removed from the data to test the above findings and the same result was observed. It was found that the level and type of qualification are more important for project performance than the personal experience of the staff complement.

Table 4.3 Comparison of staff personal experience in the construction industry by project performance

	Core staff personal experience	
DoD (%)	**Construction Related**	**Not construction related**
Minimum	71	25
Maximum	∞	200
Average	182	86

Figure 4.11 further demonstrates the relationship between personal experience and project performance as represented in Table 4.3.

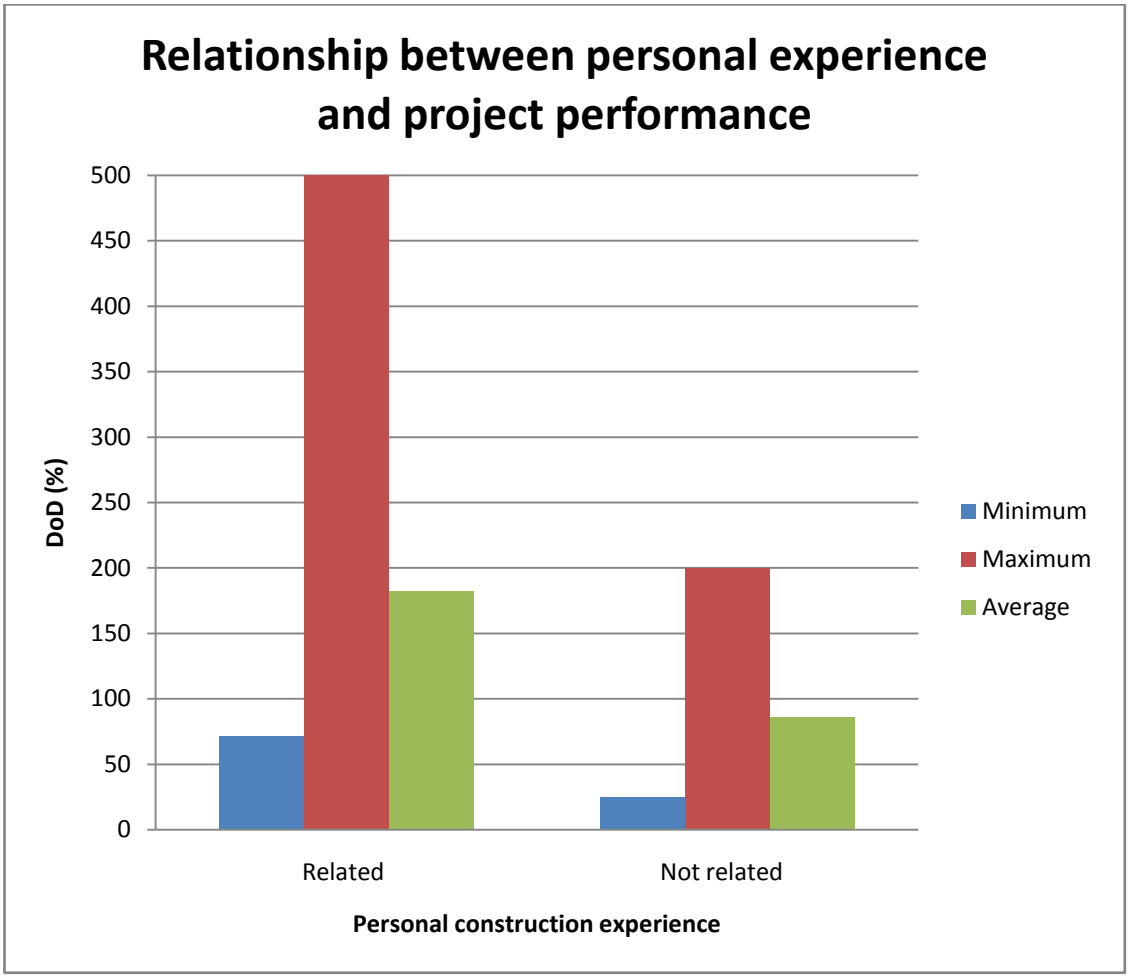


Figure 4.11 Relationship between personal experience and project performance

4.6.1.2 Emerging contractor's company experience and project performance

Business experience is necessary to build competence; it also builds client confidence in the ability of the business to achieve preset goals. This research explored the relationship between emerging contractors' business experience and project performance. Projects undertaken by the respondents were evaluated to determine the types of projects each business has undertake in the civil engineering and general building related fields.

It was found that the respondents get most of their construction work from the public sector with typical department being:

- Department of Health
- Department of Roads and Transport
- Department of Education
- Department of Agriculture
- Department of Public Works
- Local municipalities

The types of projects that were found to be conducted by the contractors were classified into the following general categories:

- Water resource
    - Boreholes
    - Bulk water supply
    - Sewage works
    - Irrigation
- Road works
    - Road construction and maintenance
    - Stormwater drainage
- Supply and delivery
    - Computers
    - Stationary
    - Cleaning material
- Fencing
- Livestock infrastructure

- Civil works
    - Earthworks
    - Concrete works
    - Structures

Appendix F shows the number of projects each respondent conducted within the specified categories.

Figure 4.12 shows the relationship between contractor's company experience in CE and GB projects in terms of number of projects conducted to project performance. The results show that companies that have undertaken more projects have lower DoD and, therefore, better project performance. This supports the initial research statement that business experience in construction related fields prior to a particular project will result in better performance in that project.

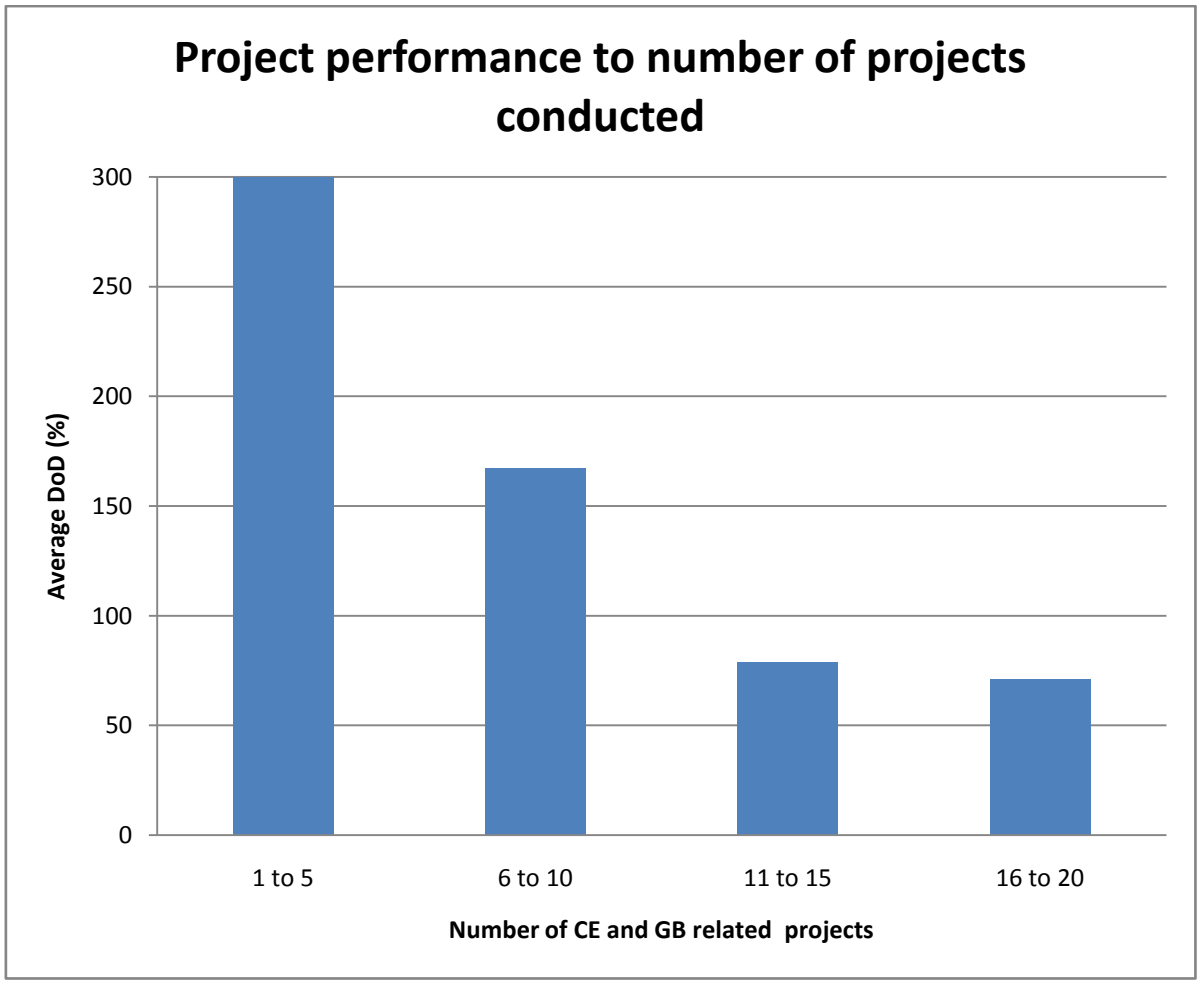


Figure 4.12 Relationship between company experience and project performance

It should also be noted that the contractor with the highest number of projects in the CE and GB related projects is Contractor 7 with a total of 19 projects. This contractor also has a staff compliment with technical qualifications, showing the importance of the combination of qualifications and business experience. On the other hand, Contractor 3 has the lowest observed number of CE and GB related projects, four, along with Contractor 9 and Contractor 15 and have been seen throughput to fall under groups with high DoDs. Contractor 3's highest qualification is a matric certificate, Contractor 9 has a national certificate in a non-technical field and Contractor 15's qualification is unknown. These results further cement the relationship between technical qualifications and company experience and project performance.

4.6.1.3 Years in the construction industry and project performance

The number of years that the contractor has been in operation in the industry may also be used as a measure of experience. The relationship between the number of years in the industry and project performance was investigated in order to determine whether or not the same results that are represented on Figure 4.12, would be found. A different result was found and represented on Figure 4.13.

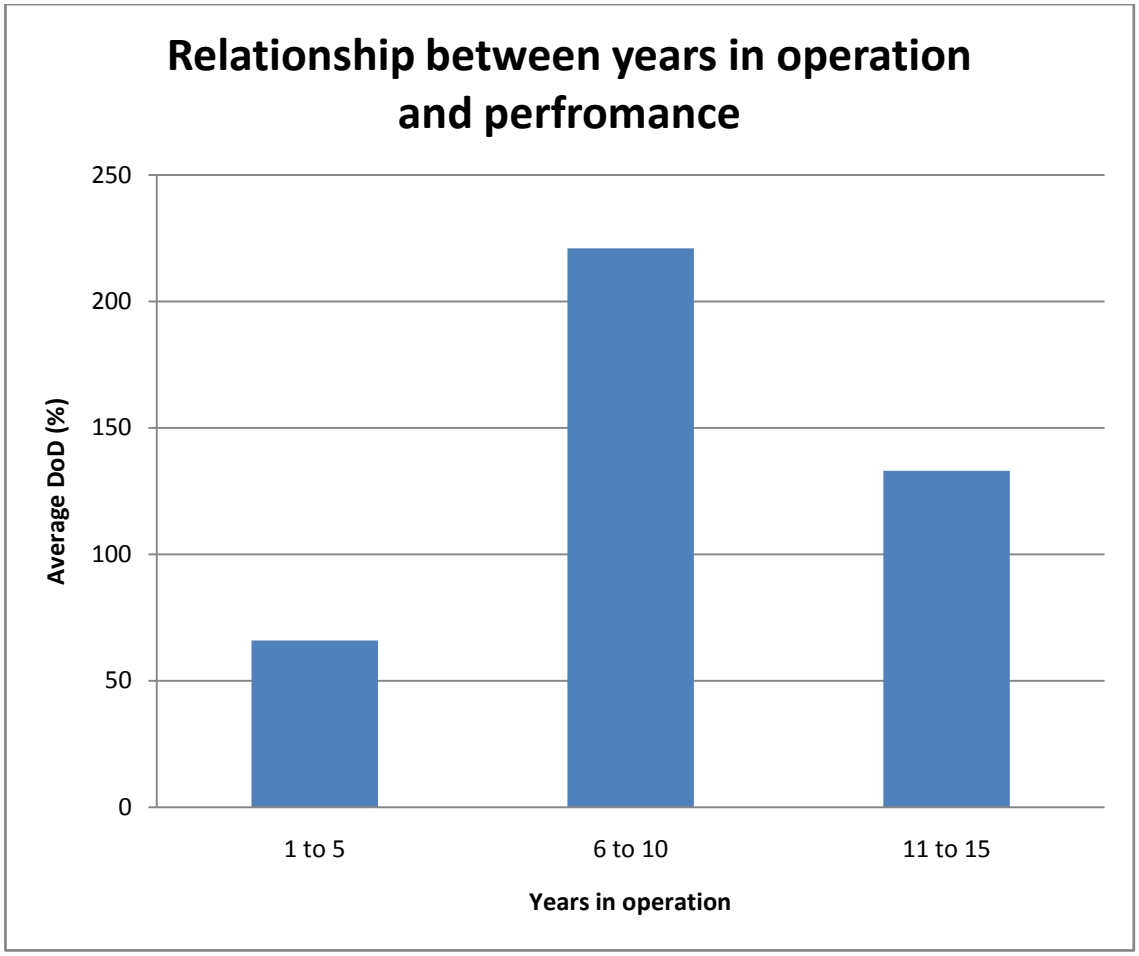


Figure 4.13 Relationship between number of years in the industry and project performance

The results show that the number of years in the industry does not necessarily result in better project performance. Further investigation was done to find out why this is. It was found that the lowest DoD was achieved by Contractor 6 who has a staff compliment with technical qualifications. This may the reason for the above results. This contractor also had the second highest number of CE and GB related projects, fifteen (15) in total. It may, therefore, be said that the number of projects conducted is more important or adds more value than the number of years in operation. The number of projects conducted develops competence.

4.6.1.4 CIDB grade and project performance

An investigation was done to test the assumption that the CIDB grading is a reflection of company experience and, therefore, the higher the grading the better the project performance. The highest CIDB grading was selected for contractors registered under both GB and CE categories. The results do not reflect a clear relationship. It was found, however, that the projects that were conducted by contractors that fall under CIDB grade 1 generally have high DoDs and have projects that were incomplete (see Appendix G). Such projects were Project 3 and Project 8 by Contractor 3 and Contractor 8, respectively. The lowest DoD, 25%, occurs in Project 6 by Contractor 6 who has a CIDB grade 7. The result may be due the use of an average and may only be reflecting the fact that there are more Grade 1 contractors than the higher grades.

Figure 4.14 highlights the relationship between the CIDB grading and contractor project performance.

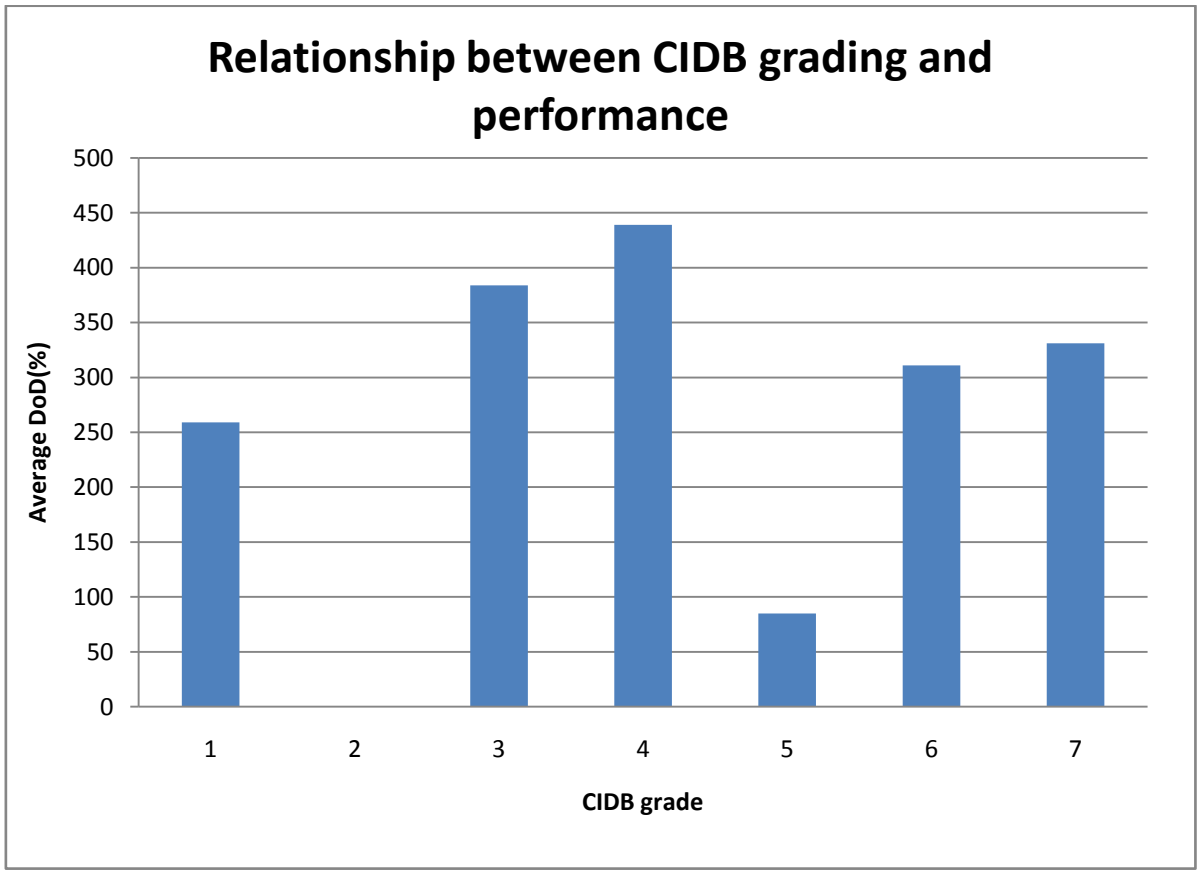


Figure 4.14 Relationship between CIDB grading and project performance

4.7 COMPARISON OF JOINT VENTURES TO NON-JOINT VENTURES

It is expected that contractors who enter into joint ventures (JV) will generally perform much better than contractors who bid individually. A comparison was done between joint ventures and non-joint venture against the project performance indicator, DoD. The results showed that the JVs had lower project performance compared to non-joint ventures, see Figure 4.15. Furthermore, the results showed that the non-joint ventures had staff with technical qualifications and their companies had undertaken more projects. This may be due to the fact that the procurement process does not put an emphasis on technical capacity, but rather on CIDB grading and price. The result of this may be contractors entering into joint ventures to boost their CIDB grading and not for sharing of technical expertise as expected.

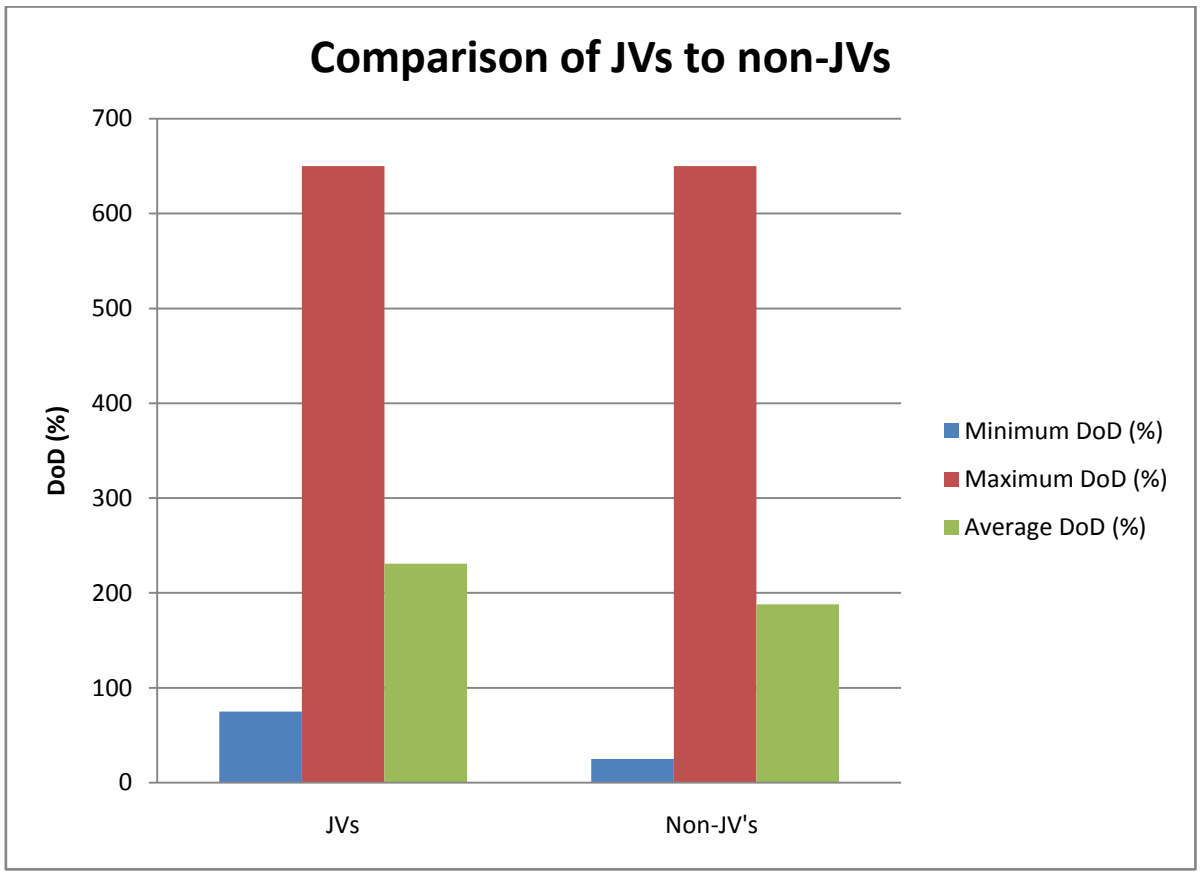


Figure 4.15 Comparison of joint venture to non-joint ventures

CHAPTER 5: SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 SUMMARY

In order to summarize this research, the objectives of the study were revisited and the findings highlighted according to each objective. In defining project performance, it was found that this measure of the degree in which project goals are met, can be measured against time, cost and quality. The time factor was used to assess project performance on the emerging contractors under study during the analysis of the empirical data in this research.

Determine the factors that affect emerging contractor performance:

The factors that affect contractor performance in the construction industry, especially in the public sector, were investigated. Literature showed that the most prevalent factors that affect emerging contractor performance are contractor competence, project delays, unethical conduct and lack of resources. The competencies that were linked to project performance were skills, technical qualifications, experience, financial and project management and project planning. Resources such as labour, plant and equipment, and financial resources were found to have a great effect on the performance of emerging contractors in the construction industry, more especially the public sector. Project delays have financial implications as penalties can be imposed and these losses affect the success of the business. Project delays can be as a result of the client's action or inactions, for example, late payments, deviation orders and changes in scope of works. Contractor actions and inactions can also cause project delays and may be caused by the contractor's incompetence, shortage or lack of skilled labour and lack of resources. Unethical conduct, especially during tendering and procurement, has been shown by literature to be typical of the public sector. These issues may be the source of the actions or inaction of contractors or the client (i.e. government organisations) and may result in appointment of incompetent contractors, project delays and cost overruns. The appointment of incompetent contractors may result in poor quality 'products' and unsatisfied beneficiaries or clients, which are a reflection of poor project performance. Other factors that affect contractor performance are the tendering process and contractor development programmes. The way in which both are set up may either be advantageous to the contractors or may set them up for failure in the long run.

Determine the gaps or limitations in literature in order to use empirical data to address such issues:

After the literature review (Chapter 2) it was found that qualifications and experience provide competence in the construction industry. However, the relationship between qualifications and experience, and project performance had not been investigated extensively in the South African industry. Not much work was available in the body of knowledge to demonstrate this relationship, especially through empirical data collection and analysis. This research, therefore, was primarily supported by the empirical data that was collected for a state organisation in MP and from emerging contractors in the province in order to address the limitations in literature. The findings were presented quantitatively to demonstrate each relationship and test the research statements.

Analyse the relationship between emerging contractors' technical qualifications and project performance:

This research was based on the research statement that proposed that technical qualifications are essential for good project performance. This was the first research statement of the study and empirical data was collected to test this research statement. It was found that contractors with technical qualifications generally perform better than contractors with non-technical qualifications on a project level. The technical qualifications were found to be related to the built-environment. In addition to the positive relationship between technical qualifications and project performance, it was found that the level of qualification is an added advantage, regardless of the type of qualification. Emerging contractors that only have matric qualifications generally showed poor project performance as compared to contractors with higher education backgrounds. The type of qualification has been seen to be more important than the level of qualification when relating them to project performance.

Analyse the relationship between emerging contractors' experience and project performance:

The second research statement was that contractor experience will have a positive relationship with project performance. This research found that there is positive relationship between personal experience of contractors or their core staff and project performance. Contractors with owners or staff with construction related experience prior to starting or joining construction companies show better project performance than contractors with non-construction related experience. A positive relationship was also found between project

performance and the emerging contractor business experience. The number of years in operation also reflects business experience; however, this did not show a positive relationship with project performance. This was attributed to the fact that the number and type of projects conducted provide better competence than the number of years in operation.

It was also observed that contractors registered under CIDB grade 1 perform poorly which can be attributed to lack of or insufficient experience in the industry. There are some contractors who performed better than other contractors with higher grades; however, those contractors have technical qualifications and relevant industry experience. This study also found that contractors who entered into joint ventures did so in order to boost CIDB grading and not to share technical resources. This conclusion was reached through the observation that the non-joint ventures performed better due to the possession of technical qualifications and their companies had more experience in terms of number of projects carried out.

5.2 CONCLUSION

It can be argued from the studies that have been conducted around the subject of emerging contractor performance that very little work has been done to find out what correlation exists between contractor performance, and contractor experience and qualifications. This investigation was aimed at finding the relationship between emerging contractor project performance in public sector projects and, their qualifications and experience. Project information was collected along with the respective contractor's experience and the qualifications of the key personnel of the respective emerging contractor organisations. A comparison was then done between contractors with shorter delays to those with significantly longer delays. It was concluded that contractors with relevant construction experience and technical qualifications experience shorter to no delays in projects, therefore, better project performance. Contractors with no experience and qualifications show poor performance when measured against the time factor. It was also found that, where technical qualifications are lacking, higher education is an advantage to project performance. The number of construction relevant projects conducted by the contractor promotes competence and, therefore, aid better project performance.

5.3 RECOMMENDATIONS

5.3.1 Tendering and procurement process

This research found that all 30 projects under investigation had been delayed, sowing poor project performance. This may be evidence that the time that is specified for completion of the work by the internal engineers or consultants during the design and tendering stage is insufficient. It is, therefore, recommended that government organisations revise the specified construction period during the tendering stage or revise the criteria used to set the period.

There is a definite need to develop contractor development programmes that will focus on improving emerging contractors' project performance. Such programmes should focus on developing the technical qualifications and skills of contractors and provide construction experience. It is further recommended that contractors who have participated in such programmes should be given preference in the tendering and procurement processes.

5.3.2 Policy

It is further recommended that the procurement policy be amended such that the appointment process is biased to contractors with technical qualifications and experience in the construction industry. It may be beneficial that highly technical projects be reserved for experienced contractors. Contractors with no experience should also be encouraged to enter into JVs with experienced contractors for highly technical projects in order to develop their skills. The qualifications that need to be focused on are those of the core staff of the business. Experience may be that of the staff in the business or the overall business experience. This also means that the years of operation should be considered when appointing contractors.

5.3.3 Collaboration and information sharing

Government organization that participate in public procurement and the use of emerging contractors along with private sector clients and practitioners should collaborate in developing standards and codes of practice for the construction industry. This collaboration may also require the involvement of statutory bodies such as the CIDB, the Engineering

Council of South Africa (ECSA), and the South African Council for Project and Construction Management Professions (SACPCMP).

Project performance of emerging contractors should be recorded in order to evaluate compliance with best practise guidelines and standards. This information should then be shared across board to ensure that all parties have an idea of the potential project performance of prospective contractors prior to appointment. This can also be used as part of the selection process during procurement in the public sector. A platform such as the CIDB may be used for such information. It should also be noted that the CIDB has recommended a similar approach in the 2012/2013 annual report.

5.3.4 Contracting companies

Emerging contractor companies that are already established should take advantage of the interventions of the CIDB and other training institutes in order to develop their technical knowledge. Contractors who wish to enter into the industry should seek to acquire higher education or tertiary qualifications, ideally in the technical fields. Artisan and technician level qualifications would be more advantageous to contractors as the formal training is more practically based than the extensively theory based engineering, project management and quantity surveying four-year or honours degrees.

5.3.5 Project management competence development

Contracting companies need permanently employed project managers who are trained, have experience and are knowledgeable in the following areas as proposed by Fong and Chan (2004):

- technical expertise,
- management expertise,
- business expertise,
- leadership expertise, and
- effective communication capabilities.

These project management competencies can be acquired through tertiary and other institutions. Some institutions in South Africa offer short courses in the project management area.

5.3.6 Recommendations for further study

- Further study in this area is required on a bigger sample and on a broader scale (focusing on the whole of South Africa) in order for the results to be more generalizable.
- A training programme needs to be developed for emerging contractors in the public sector. The programme needs to address the issues addressed in this paper and develop competencies that will ensure the success of emerging contractors.

CHAPTER 6: REFERENCES

Abdul-Rahman, H., Yahya, I. A., Berawi, M. A., and Wah, L. W., 2008, 'Conceptual delay mitigation model using a project learning approach in practice', *Construction Management and Economics*, 26(1), 15-27.

Adams, O.A., 1995, 'Indigenous contractors' perceptions of the constraints on contractors' performance and development programmes required in Nigeria', *Habitat International*, 19(4), 599-1995.

Adnan, H., Hashim, N., Yusuwan, N.M., and Ahmad, N., 2012, 'Ethical issues in the construction industry: Contractor's perspective', *Procedia - Social and Behavioral Sciences*, 32, 719-727.

Alkass, S., Mazerolle, M., and Harris, F., 1996, 'Construction delay analysis techniques', *Construction Management and Economics*, 14(5), 375-394.

Alzahrani, J.I., and Emsley, M.W., 2013, 'The impact of contractors' attributes on construction project success: A post construction evaluation', *International Journal of Project Management*, 31(2), 313-322.

Arditi, D., Akan, G. T., and Gurdamar, S., 1985, 'Reasons for delays in public projects in Turkey', *Construction Management and Economics*, *3*(2), 171-181.

Arditi, D. and Pattanakitchamroon, T., 2006, 'Selecting a delay analysis method in resolving construction claims', *International Journal of Project Management*, 24(2), 145–55.

Argenti, J., 1976, 'Corporate planning and corporate collapse', *Long Range Planning*, 9(6), 12-17.

Aveng Group, 2014, *Integrated Report 2014*, viewed 09 January 2015, from http://www.aveng.co.za/sites/aveng.co.za/files/annual_reports/download-1414481908_download-1414474226_Aveng%20AR%202014_Lo-Res.pdf.

Assaf, S.A., Al-Khalil, M., and Al-Hazmi, M., 1995, 'Causes of delay in large building construction projects', *Journal of management in engineering*, 11(2), 45-50.

Bowen, P.A., Edwards, P.J., and Cattell, K., 2012, 'Corruption in the South African construction industry: a thematic analysis of verbatim comments from survey participants', *Construction Management and Economics*, 30(10), 885-901.

Buys, F. and Ludwaba, D., 2012, 'The potential of built-environment professionals' contribution towards emerging contractor development: review article', *Acta Structilis: Journal for the Physical and Development Sciences*, 19(2), 74-89.

Carte, D., 2012, 'SA's big-five: Winners in construction often lose', moneryweb.co.za, viewed 09 January 2015, from http://www.moneyweb.co.za/moneyweb-industrials/sas-bigfive-winners-in-construction-often-lose?sn=2009+Detail.

Chan, A.P.C., and Chan, A.P.L., 2004, 'Key performance indicators for measuring construction success', *Benchmarking: An International Journal*, 11(2), 203-221.

Cheung, S.O., Suen, H.C.H., Cheung, K.K.W., 2004, 'PPMS: a Web-based construction project performance monitoring system', *Automation in Construction*, 13(3), 361-376.

Clarke, L. and Wall, C., 1996, *Skills in the Construction Process: A Comparative Study of Vocational Training and Quality in Social House building*, Policy Press, University of Bristol.

Construction Industry Development Board (CIDB), 2009, *March 2009 Status Quo Report: SA Contractor Development Programmes*, CIDB, Pretoria, South Africa.

Construction Industry Development Board (CIDB), 2011a, *Guidelines for contractor registration*, viewed 15 October 2014, from http://www.cidb.org.za/documents/kc/cidb_publications/brochures/brochure_contractor_registration_guidelines.pdf.

Construction Industry Development Board (CIDB), 2011b, *Framework: National Contractor Development Programme*, CIDB, Pretoria, South Africa.

Construction Industry Development Board (CIDB), 2013, *2012/2013 Annual report*, CIDB, Pretoria, South Africa.

Croswell, J., and McCutcheon, R., 2001, 'Small contractor development and employment—A brief survey of Sub-Saharan experience in relation to civil construction' In *Urban Forum*, 12(3), 365-379.

Department of Trade and Industry (dti), 2004, *Annual Review of Small Business in South Africa 2003*, Enterprise Development Unit, Department of Trade and Industry, Pretoria, South Africa.

Edum-Fotwe, F.T., and McCaffer, R., 2000, 'Developing project management competency: perspectives from the construction industry', *International Journal of Project Management*, 18(2), 111-124.

Ejaz, N., Hussain, J., Shabbir, F., Shamim, M.A., Naeem, U.A., Tahir, M.F., Ahmad, N. and Frooq, Q.U., 2013, 'Assessment of Most Critical Success Factors for Mega Construction Projects in Pakistan', *Life Science Journal*, 10(10s), 255-261.

Eyiah, A.K., 2001, 'An integrated approach to financing small contractors in developing countries: A conceptual model', *Construction Management and Economics*, 19(5), 511-518.

Faridi, A., and El-Sayegh, S., 2006, 'Significant factors causing delay in the UAE construction industry', *Construction Management and Economics*, 24(11), 1167-1176.

Fouché, D. P., and Rolstadås, A., 2010, 'The use of performance measurement as a basis for project control of offshore modification oil and gas projects', *Production Planning and Control*, 21(8), 760-773.

Fredland, E.J., and Morris, C.E., 1976, 'A cross section analysis of small business failure', *American Journal of Small Business*, 1(1), 7-18.

Ganeson, S., 1982, *Management of small construction firms: A case study of Sri Lanka, Singapore, Hong Kong, Thailand, the Philippines and Japan*, Asian Productivity Organization, Tokyo.

Gann, D., and Senker, P., 1998, 'Construction skills training for the next millennium', *Construction Management and Economics*, 16(5), 569-580.

Gharakhani, D., Sinaki, M.T., Dobakhshari, M.A. and Rahmati, H. (2013), 'the Relationship of Customer Orientation, Customer Satisfaction, Customer Loyalty and Innovation in Small and Medium Enterprises', *Life Science Journal*, 10(6s), 684-689.

Golafshani, N., 2003, 'Understanding reliability and validity in qualitative research', *The Qualitative Report*, 8(4), 597-606.

Google Finance, n.d., *Finance Data Listing and Disclaimers*, viewed 13 January 2015, from https://www.google.co.za/intl/en/googlefinance/disclaimer/.

Group Five, 2014, *Integrated annual report 2014*, viewed 09 January 2014, from http://www.g5.co.za/reports/ar_2014/pdf/integrated-report-2014.pdf.

Guillaume, R., Houe, R., and Grabot, B., 2014, 'Robust competence assessment for job assignment', *European Journal of Operational Research*, 238(2), 630-644.

Hanson, D. N., 2006, *Causes of client dissatisfaction in the South African building industry and ways of improvement: the contractors' perspectives* (Doctoral dissertation, Faculty of Engineering and the Built Environment, University of the Witwatersrand).

Hanson, D., Mbachu, J. and Nkando, R., 2003, Causes of client dissatisfaction in the South African Building industry and ways of improvement: the contractors' perspectives, in CIDB, South Africa

Harrison, F. L., and Lock, D., 2004, *Advanced project management: A structured approach*, Gower Publishing, Ltd.

Hartman, F.T., 2000, *Don't park your brain outside*, Newtown Square, PA: Project Management Institute.

Hignett, S., 2005, 'Qualitative methodology', *Evaluation of Human Work, 3*, 113-128.

Iyer, K.C., and Jha, K.N., 2005, 'Factors affecting cost performance: Evidence from Indian construction projects', *International Journal of Project Management*, 23(4), 283-295.

Jaafar, M., and Abdul-Aziz, A.R., 2005, 'Resource-based view and critical success factors: A study on small and medium sized contracting enterprises (SMCEs) in Malaysia', *International Journal of Construction Management, 5*(2), 61-77.

Jaafar, M., Ramayah, T. and Nasurdin, A.M., 2005, 'Entrepreneurial Characteristics of Contractors in a Developing Country: An Ethnic Comparison'. *International Journal of Management and Entrepreneurship*, 1(1), 21-29.

Jaafar, M., Ramayah, T. and Osman, M., 2004, 'Owner/Manager Characteristics and Business Success: A Study among Malaysian Contractors'. *The 18th Annual Conference of the Australian & New Zealand Academy of Management 2004*, "People First – Serving Our Stakeholders". Dunedin, New Zealand. 08-11 December 2004.

Jiang, T., Chen, X., and Shu, D., 2011, 'An Improved Integrated Tender Evaluation Method Based On Analytic Hierarchy Process', *Intelligent Automation & Soft Computing*, 17(5), 651-658.

Jo, H., and Lee, J., 1996, 'The relationship between an entrepreneur's background and performance in a new venture', *Technovation*, 16(4), 161-211.

Joppe, M., 2000, ,The Research Process', Retrieved February 25, 1998, from http://www.ryerson.ca/~mjoppe/rp.htm cited by Golafshani, 2003.

Lin, C.Y.Y., 1998, 'Success factors of small-and medium-sized enterprises in Taiwan: An analysis of cases', *Journal of Small Business Management*, 36(4), 43-56.

Lo, T.Y., Fung, I.W.H. and Tung, K.C.F., 2006, 'Construction delays in Hong Kong civil engineering projects', *Journal of Construction Engineering and Management*, 132(6), 636–49.

Magoro, M.J. and Brynard, P.A., 2010, 'Difficulties associated with the implementation of the preferential procurement policy in conjunction with a low-cost housing programme: A South African contextualisation', *Politeia,* 29(3), 4-23.

Martin, L., and Root, D., 2012, 'Profiling emerging contractor for effective transformation in the South African construction sector', *Development Southern* Africa, 29(2), 209-223.

Marzouk, M.M., El Kherbawy, A.A., and Khalifa, M., 2013, 'Factors influencing sub-contractors selection in construction projects', *HBRC Journal*, 9(2), 150-158.

Mezher, T.M., and Tawil, W., 1998, 'Causes of delays in the construction industry in Lebanon', *Engineering, Construction and Architectural Management*, 5(3), 252-260.

Mofokeng, T.G., 2012, *Assessment of the causes of failure among small and medium sized construction companies in the Free State Province* (Doctoral dissertation, University of Johannesburg).

Murray & Roberts, 2014, *Annual financial statement for the year ended 30 June 2014*, viewed 09 January 2014, from http://www.murrob.com/pdf/annual_reports/ar_2014/Full_Annual_Financial_Statements.pdf.

Myers, M.D., and Avison, D., 1997, 'Qualitative research in information systems' *Management Information Systems Quarterly*, 21, 241-242.

Neely, A., 1998, *Measuring Business performance*, Economist books, London.

Nemaenzhe, P.P., 2010, *Retrospective analysis of failure causes in South African small businesses* (Doctoral dissertation, University of Pretoria).

Okpara, J.O., and Kabongo, J.D., 2009, 'An empirical evaluation of barriers hindering the growth of small and medium sized enterprises (SMEs) in a developing economy', *African Journal of Business and Economic Research*, 4(1), 7-21.

Okpara, J.O., and Wynn, P., 2007, 'Determinants of small business growth constraints in a Sub-Saharan African economy', *S.A.M. Advanced Management Journal*, 72(2), 24-35.

Peacock, R., 2000, 'Failure and assistance of small firms', *Small Enterprise Series,* 1, 1-56.

Peters, L.M., and Zelewski, S., 2007, 'Assignment of employees to workplaces under consideration of employee competences and preferences', *Management Research News*, 30(2), 84-99.

Pillay, S., 2004, 'Corruption – the challenge to good governance: a South African perspective', *International Journal of Public Sector Management*, 17(7), 586–605.

Prais, S.J., and Steedman, H., 1986, 'Vocational training in France and Britain: The building trades,' *National Institute Economic Review*, 116(1), 45-55.

Pretorius, M., 2009, 'Defining business decline, failure and turnaround: A content analysis', *South African Journal of Entrepreneurship and Small Business Management*, 2(1), 1-16.

Republic of South Africa, 1996, *The Constitution of the Republic of South Africa 108 of 1996*, Government Gazette, Issue No. 38.

Republic of South Africa (RSA), 2000, *Construction Industry Development Board Act 38 of 2000*, Government Gazette, vol. 425, No. 21755.

Republic of South Africa, 2000, *Preferential Procurement Policy Framework Act 05 of 2000*, National Treasury, South Africa.

Richter, A., 1998, 'Qualifications in the German construction industry: Stocks, flows and comparisons with the British construction sector', *Construction Management and Economics*, 16(5), 581-592.

Rozewski, P., and Malachowski, B., 2009, 'Competence management in knowledge-based organisation: Case study based on higher education organisation', *Knowledge Science Engineering and Management*, 5914, 358-369.

Rwelamila, P.D. and Hall, K.A., 1995, 'Total systems intervention: an integrated approach to time, cost and quality management', *Construction Management and Economics*, 13(3), 235–41.

Sambasivan, M. and Yau, W.S., 2007, 'Causes and effects of delays in Malaysian construction industry', *International Journal of Project Management*, 25(5), 517-526.

Shepherd, D.A., Wiklund, J., and Haynie, J.M., 2009, 'Moving forward: Balancing the financial and emotional costs of business failure', *Journal of Business Venturing*, 24(2), 134-148.

Stefanutti Stocks, 2014, *Unaudited condensed consolidated results for the six months ended 31 August 2014*, viewed 09 January 2014, from www.stefanuttistocks.com/InvestorRelations/Results.aspx.

Storey, D.J., 1994, *Understanding the Small Business Sector*, Routledge, London.

Suikki, R., Tromstedt, R., and Haapasalo, H., 2006, 'Project management competence development framework in turbulent business environment', *Technovation*, *26*(5), 723-738.

Sweis, R.J., Bisharat, S.M., Bisharat, L., and Sweis, G., 2014, 'Factors Affecting Contractor Performance on Public Construction Projects', *Life Science Journal*, 11(4s), 28-39.

Tao, L., and Kumaraswmay, M., 2012, 'Unveiling relationships between contractor inputs and performance outputs', *Construction Innovation: Information, Process, Management*, 12(1), 86-98.

Temtime, Z.T., and Pansiri, J., 2004, 'Small business critical success/failure factors in developing economies: SME evidence from Botswana', *American Journal of Applied Sciences*, 1(1), 18-25.

Thwala, W.D., and Mvubu, M., 2005, 'Current challenges and problems facing small and medium size contractors in Swaziland', *African Journal of Business Management*, 2(5), 93-98.

Transparency International, 2005, *The global corruption report 2005: Corruption in construction and post-conflict reconstruction*, Pluto Press, London.

Turner, J.R., 1999, *Handbook of project-based management*, McGraw Hill, London.

Tushabomwe-Kazooba, C., 2006, 'Causes of small business failure in Uganda: A case study from Bushenyi and Mbarara towns', *African Studies Quarterly*, 8(4), 1-13.

Upson, A., 1987, *Financial management for contractors*, BSP Professional Books, London.

Van Eeden, S., Viviers, S. and Venter, D., 2003, 'A comparative study of selected problems encountered by small businesses in the Nelson Mandela, Cape Town and Egoli metropoles', *Management Dynamics*, 12(3), 13-23.

Van Witteloostujin, A., 1998,'Bridging behavioural and economic theories of decline: Organizational inertia, strategic competition, and chronic failure', *Management Science*, 44(4), 501-519.

WBHO, 2014, *Integrate report 2014*, viewed 09 January 2014, from http://irx.exchange/?get_group_doc=35/1413619753-full.pdf.

Xiao, H., and Proverbs, D., 2003, 'Factors influencing contractor performance: An international investigation', *Engineering, Construction and Architectural Management*, 10(5), 322-332.

Yusuf, A., 1995, 'Critical success factors for small business: Perceptions of South Pacific entrepreneurs', *Journal of Small Business Management*, 33(2), 68-73.

Zulu, S., and Chileshe, N., 2010, 'Service quality of building maintenance contractors in Zambia: A pilot study', *International Journal of Construction Management*, 10(3), 63-81.

APPENDIX A: CIDB CONTRACTOR REGISTRATION CATEGORIES

DEFINITION	BASIC WORKS TYPE	EXAMPLES
Civil Engineering (CE)		
Construction Works primarily concerned with materials such as steel, concrete, earth & rock & their application in the development, extension, installation, maintenance, removal, renovation, alteration, or dismantling of building and engineering infrastructure	Water, sewerage, roads, railways, harbours and transport, urban development & municipal services	• Structures such as cooling tower, bridge, culvert, dam, grand stand, road, railway, reservoir, runway, swimming pool, silo or tunnel. • The results of operations such as dredging, earthworks and geotechnical processes. • Township services, water treatment and supply, sewerage works, sanitation, soil conservation works, irrigation works, storm-water and drainage works, coastal works, ports, harbours, airports and pipelines
General Building Works (GB)		
Construction Works that: a) are primarily concerned with the development, extension, installation, renewal, renovation, alteration, or dismantling of a permanent shelter for its occupants or contents; or b) cannot be categorized in terms of the definitions provided for civil engineering works, electrical engineering works, mechanical engineering	Works other than those categorized as: • civil engineering works • electrical engineering works • mechanical engineering works • specialist works	• Buildings for domestic, industrial, institutional or commercial occupancies • Car ports • Stores • Walls

DEFINITION	BASIC WORKS TYPE	EXAMPLES
works, or specialist works		
Electrical Engineering Works – Building (EB) – Electrical certificate required		
Construction Works that are primarily concerned with the installation, extension, modification or repair of electrical installations in or on any premises used for the transmission of electricity from a point of control to a point of consumption, including any article forming part of such an installation	All electrical equipment forming an integral and permanent part of buildings and/or structures, including any wiring, cable jointing and laying and electrical overhead line construction	• Electrical installations in buildings • Electrical reticulations within a plot of land (erf) or building site • Standby plant and uninterrupted power supply • Verification and certification of electrical installations on premises
Electrical Engineering Works – Infrastructure (EP)		
Construction Works that: a) are primarily concerned with the development, extension, installation, renewal, renovation, alteration, or dismantling of a permanent shelter for its occupants or contents; or b) cannot be categorised in terms of the definitions provided for civil engineering works, electrical engineering works, mechanical engineering works, or specialist works	Building & ancillary works other than those categorised as: • civil engineering works • electrical engineering works • mechanical engineering works • specialist works	• Buildings for domestic, industrial, institutional or commercial occupancies • Car ports • Masonry (brick, block or stone) and lightly reinforced or unreinforced cast in-situ concrete walls and timber fences • Stores • Walls
Mechanical Engineering Works (ME)		
Construction Works that are primarily concerned with the development, extension, installation, removal, alteration, renewal of engineering	• Machine systems including those relating to the environment of building interiors • Gas transmission and	• Air-conditioning and mechanical ventilation • Boiler installations and steam distribution • Central heating

DEFINITION	BASIC WORKS TYPE	EXAMPLES
infrastructure for gas transmission and distribution, solid waste disposal, heating, ventilation and cooling, chemical works, metallurgical works, manufacturing, food processing and materials handling	distribution systems • Pipelines • Materials handling, lifting machinery, heating, ventilation and cooling, pumps • Continuous process systems, chemical works, metallurgical works, manufacturing, food processing such as that in concentrator machinery and apparatus, oil and gas wells, smelters, cyanide plants, acid plants, metallurgical machinery, equipment and apparatus, and works necessary for the beneficiation of metals, minerals, rocks, petroleum and organic substances or other chemical processes	• Centralised hot water generation • Compressed air, gas and vacuum installations • Conveyor and materials handling installations • Continuous process systems involving chemical works, metallurgical works, oil and gas wells, acid plants, metallurgical machinery, equipment and apparatus, and works necessary for the beneficiation of metals, minerals, rocks, petroleum and organic substance and other chemical processes • Dust and sawdust extraction • Kitchen equipment • Laundry equipment • Refrigeration & cold rooms • Waste handling systems (including compactors)
Source: CIDB (2011a)		

APPENDIX B: CIDB CONTRACTOR REGISTRATION FORM

Enterprise name: _____

Section A Type Of Application

Please indicate the type of application with an "x"

cidb registration number (for registered contractors): _____

New Application for Registration ☐ Addition of a Class of Works ☐

Upgrade of Class of Works Status ☐ 3 year renewal ☐

Section B About Your Enterprise

SECTION B i: Enterprise Particulars

Name of Enterprise: _____

Trading as: _____

Type of Enterprise Please indicate with an "X"

Public Company ☐ Private Company ☐ Close Corporation ☐ Foreign Company ☐

Sole Proprietor ☐ Partnership ☐ Section 21 Company ☐ Other ☐ (Please specify): _____

Date Enterprise Registered: _____

Date operations started: _____

Company/ CC Registration Number: _____

(Attach documents as per the checklist)

Head Office Physical Address: _____ Head Office Postal Address: _____

_____ _____

_____ Code: _____ _____ Code: _____

Province: _____ Province: _____

Contact Person

Title: _____ Initials: _____ Surname: _____

Designation: _____ email: _____

Telephone: (___) _____ Fax: (___) _____ Cell: _____

SECTION B ii: Principal(s) and Ownership/Interest

Complete details for each principal in the Enterprise and attach copy of Identity Document for each. (See Checklist)
A principal is a partner in a partnership, a sole proprietor, a director or a shareholder in a company or a member of a close corporation. (Note: Use separate list if necessary)

Initials and Surname	*Identity Number*	*RSA Citizen*		*Black*		*Gender*		*% of work time devoted to this enterprise*	*% of shares or interest held*	*% voting rights*
		Y	N	Y	N	M	F			

Enterprise name: _____

Section C Registration as a Potentially Emerging Enterprise

Please complete section Ci below in order to be considered for potentially emerging enterprise status (See Guidance page "f")

"Emerging Enterprise" means an enterprise which is owned, managed and controlled by previously disadvantaged persons and which is overcoming business impediments arising from the legacy of apartheid.

SECTION C i: Management Decisions and Control

State the name of previously disadvantaged principals responsible for day to day management decisions and indicate with an "X" which activities they are responsible for.

Name	*Payment Authorization & Cheque signing*	*Signing & co-signing for loans*	*Acquisition of lines of credit*	*Sureties*	*Major purchases or acquisitions*	*Signing contracts*	*Supervision of personnel*

SECTION C ii: B – BBEE Status "OPTIONAL"

B- BBEE STATUS: _____

Date of Certification: MM/YYYY Expiry Date: MM/YYYY

(Attach proof of B-BBEE Certification.)

Section D Determining Financial Capability

SECTION D i: Best Annual Turnover

Attach financial statements for the 2 financial years immediately preceding the application (See Checklist.)
(See Guidance page "d" for more information.)

Financial Year End: MM/YYYY Total Turnover excl. VAT: _____

Previous Financial Year: MM/YYYY Total Turnover excl. VAT: _____

SECTION D ii: Available Capital

Attach financial statements for the 2 financial years immediately preceding the application ***and***, if applicable, the description & proof of financial sponsorship. ***(See Checklist)***

Bank Name: _____ Branch Name: _____ Branch Code: _____

Account Holder Name: _____ Account Number: _____

Account Type: Please indicate with an "X" Current: ☐ Savings: ☐ Other: specify _____

From Annual Financial Statements:

Total Assets (as per the latest Financial Statements) R _____

Total Liabilities (as per the latest Financial Statements) R _____

Net Asset Value (The sum of total equity, retained income and shareholder's or member's loans): R _____

Financial Value of sponsorship(s) if any: R _____

Indicate the nature of your relationship with the sponsor(s): _____

Enterprise name: _____

Section E Track Record

Provide contract details of the largest construction works contract completed during the 5 years immediately preceding the application. Attach copies of Letter of Award, Certificate of Completion & final Payment Certificate indicating the contract value. If applicable; contractors undertaking ongoing maintenance projects should submit copies of the Letter of Award and the latest progress payment certificate indicating the value of works completed to date (See Checklist.)

Make copies of SECTION E for each class of construction works applied for.

SECTION E i: *Particulars of Employer who commissioned the Works*

Provide the following information on the Employer for whom the contract was performed.

Employer: _____

Employer's Contact Person: Title: _____ Initials: _____ Surname: _____

Telephone: (____) _____ Cell: _____

SECTION E ii: *Particulars of Contract Administrator*

Person responsible for administering the contract on behalf of the employer, e.g.: Principal Agent, Consulting Engineer, Architect, Project Manager, Construction Manager, etc.

Title: _____ Initials: _____ Surname: _____

Organization: _____

Telephone: (____) _____ Fax: (____) _____

Cell: _____ email: _____

SECTION E iii: Contract Information

Contract Title: _____ Employer's Contract No: _____

Description of Contract: _____

Indicate the class of works to which the track record is applicable. Please indicate with an "X"

General Building ☐ Electrical Engineering Infrastructure (EP) ☐ Civil Engineering ☐

Mechanical Engineering ☐ Electrical Engineering Building (EB) ☐ Specialist Works ☐

Specify which class of specialist works: _____

Were you involved as: Main Contractor ☐ Sub Contractor ☐ Joint Venture Partner ☐

Total value of your share of the contract, including VAT R _____

Please indicate % share of Joint Venture _____ (Please attach the Joint Venture Agreement)

Contract Award Date: _____ Practical Completion Date: _____

Province: _____ Municipality: _____

Note: If Sub-Contractor: Attach Sub-contract Agreement and proof of payment in the form of bank statement copies reflecting receipts of payment(s) for the particular contract.

SECTION E iv: Transfer of Track Record

The track record of one entity may be transferred to that of another entity, (Refer to Guidance page "c".)

Attach particulars of changes (See Checklist)

If this contract was performed by you, but in the name of a different entity, please tick here: ☐

What was the nature of your relationship with the previous entity? _____

Enterprise name: _____

SECTION F: Requirement for Registration in Electrical Engineering

(Applicable to contractors applying for EB Class of Works)

Attach an originally certified and signed copy of the Electrical Contractor's certificate issued in the name of the enterprise applying for registration with the cidb. ***(See Section I: Checklist)***

Registration Number: _____ Expiry Date: _____

Section G: Application for Contractor Grading Designation and Fees Payable

Indicate the contractor grading designation(s) that you are applying for. The cidb will register you in the contractor grading designation(s) that you qualify for, based on the information provided to the cidb.

(Please see Guidance Pages "g" and "h" for information and an example of how to determine the fees you must pay.)

CONTRACTOR GRADING DESIGNATION APPLIED FOR		
TENDER ALUB/RANGE APPLIED FOR *e.g. 3*	*CLASS OF CONSTRUCTION WORKS APPLIED FOR* *e.g. CE*	*ADMIN FEE PAYABLE (NON - REFUNDABLE)* Payable for each class of works applied for, including when existing classes of works are updated. (determined by the tender value range applied for)
Total Admin Fee (Add all admin fees payable to get sub-total)		
Plus Annual Fee (Determined by the highest Tender Value Range applied for)		
Total Due (Total Admin plus Annual fee)		

Note: The administration fee is payable for each class of works applied for and is non-refundable.

Section h ii: Method of Payment

How are you paying?

Electronic Funds Transfer ☐ Speed Point ☐ Direct Deposit ☐

Attach proof of payment. (See Checklist)

Note:

Please use your enterprise name as the reference when making payment
Contractors already registered with cidb, should please use their cidb registration number (CRS number) as the reference.
Cash and Cheque payments will not be accepted over the counter and via post / courier

Enterprise name: _____

Section I DECLARATION BY CONTRACTOR

Please tick the box if you consent to the sharing of financial information supplied to the cidb with an approved and authorized financial services provider ☐

In support of facilitating access to finance for contractor growth and development, I hereby authorize the cidb to disclose financial information to an approved and authorized financial services provider upon request for such.

I, the undersigned, hereby:

• ***declare that:***

- I am duly authorised to sign this application on behalf of the enterprise;
- The information furnished, as well as all documentation submitted in support of this application, is true and correct in every respect; and have been lawfully obtained; (Please attach a valid, original Tax Clearance Certificate.)
- The enterprise will abide by the ***Code of Conduct for All Parties Engaged in Construction Procurement***, as published by the ***cidb*** in the Government Gazette no. 25656 of 2003. (Also available at: ***www.cidb.org.za***);
- Neither the name of the enterprise or the name of any partner, member, director, manager or person, who wholly or partly exercises, or may exercise, control over the enterprise, appears on the Register of Tender Defaulters established in terms of the Prevention and Combating of Corrupt Activities Act of 2004;
- No partner, member, director, manager or other person, who wholly or partly exercises, or may exercise, control over the enterprise, has within the last five years been convicted of fraud or corruption;
- I will provide to the ***cidb*** any additional information that may be required with regards to this application.

• ***understand that:***

- Registration is subject to the conditions referred to on ***the front cover*** of this form;
- Incomplete applications result in delays in processing.
- Applications without relevant supporting documentation will not be processed.
- The administration fee payable per class of works applied for is non-refundable.
- The ***cidb*** will grade my enterprise based on the information provided.
- False information provided or a false declaration is a punishable offence in terms of the cidb ACT, Regulations and other applicable laws.

• ***authorise:***

- The ***cidb*** to verify the information supplied in this form;
- The ***cidb*** to publicly display my contractor grading designation.

Enterprise Name: _____

Signature: _____ Date: DD/MM/YYYY _____

Designation: _____ Print Name: _____

Source: CIDB (2011a)

APPENDIX C: NUMBER OF CONTRACTORS TRAINED PER PROVINCE

Number of Emerging Contractors Trained per Programme						
Province	Occupational Health and Safety	Construction Management	Contract Management	Pricing and Tenders	Financial Management	NEC
Free State	32	18				
Northern Cape	40		128			
Eastern Cape	27			27		
North West	41				23	
Western Cape	24		20			
Limpopo	16	21				
Mpumalanga		13	29			
Gauteng			22			18
KwaZulu-Natal	13		40			
Total number of contractors trained: 512						

Source: CIDB (2013)

APPENDIX D: TENDER EVALUATION CRITERIA FOR GOVERNMENT TENDERS

F.3.11 Evaluation of BID Offers

The procedure for evaluation of responsive BID Offers will be **Method 4: Financial Offer and Preferences**. BIDs will first be evaluated for Quality. The responsive BIDs for Quality will then be evaluated for Price and Preferences and the BID with the highest combined score for Price and Preferences, is the preferred BID.

The procedure for the evaluation of responsive BIDs is:

a) Quality – **PRE - QUALIFICATION**

Refer to table below titled "Adjudication using a Point System"

b) Financial

Refer to clause F3.11.2 of this BID document and utilising Formula 2. The number of BID evaluation points for financial offer shall be 90.

c) Financial offer and quality combined – **NOT APPLICABLE**

d) Preferences

In order to enforce the Implementation of the CRDP and to ensure local economic development, for procurement above R30 000, Department and Public Entities must allocate preference points as follows: Up to 10 points (for financial values over R1 000 000) will be awarded to service providers who complete the referencing schedule and who are found to be eligible for the preference claimed.

The preference points will be allocated according to the table below:

PREFERENCE (B-BBEE Status Level of Contributor)	
• Level 1	10 points
• Level 2	9 points
• Level 3	8 points
• Level 4	5 points
• Level 5	4 points
• Level 6	3 points
• Level 7	2 points
• Level 8	1 points
• Non-compliant contributor	0 points

The contractor will be expected to remunerate the local workers as per the guidelines stipulated by the EPWP Framework.

Adjudication Using a Point System

Responsive bids will be adjudicated using a point system which awards points on the basis set out in the table here following and described in subsequent sub-paragraphs.

QUALITY & BID EVALUATION CRITERIA FOR PREFERENCE AND PRICE	
CRITERIA	**WEIGHTING**
QUALITY – PRE QUALIFICATION	
Infrastructure and Resources available	**10**
• Plant and Equipment available owned/hired by the Bidder 10 points	
Understanding of the Scope	**25**
• Program of Works and Detailed Method Statement 15 points	
• Bill of Quantities Rates 10 points	
Staffing Profile	**10**
• Details of staff available for this Contract 10 points	
Previous Experience	**30**
• Experience relevant to this technical field 20 points	

• Experience in contracts of similar value 10 points	
Financial Ability to execute the Contract	**15**
• Proposed demand guarantee 5 points	
• Bidder's Bank rating 10 points	
CRDP Proposal	**10**
• An undertaking clearly indicating commitment to partner, guide, empower and work with a benefiting registered local Cooperative 10 points	
TOTAL QUALITY	**100**

NB: The minimum score required for quality, in order to qualify for price evaluation = 50 points out of 100 possible (50%).

Ranking Guidelines:	**% of points scored**
Non-existent or very poor	0%
Some evidence of meeting requirement	20%
Demonstrates capability not strong	40%
Meets requirement well	50%
Very well suited and responsive to requirement	80%
Perfectly suited, meets complete requirement	100%

BBBEE STATUS LEVEL OF CONTRIBUTOR		
PREFERENCE (B-BBEE Status Level of Contributor)		**10**
• Level 1	10 points	
• Level 2	9 points	
• Level 3	8 points	
• Level 4	5 points	
• Level 5	4 points	
• Level 6	3 points	
• Level 7	2 points	
• Level 8	1 points	
• Non-compliant contributor	0 points	
PREFERENCE (B-BBEE Status Level of Contributor)		**10**

F.4.2 Preferential Procurement Policy

a) General conditions

i) The following preference point systems are applicable to all BIDs:

- the 80/20 system for requirements with a Rand value of up to R1 000 000; and
- the 90/10 system for requirements with a Rand value above R1 000 000.

ii) The value of the works is estimated to exceed R1 000 000 and therefore the 90/10 system shall be applicable.

iii) Preference points for this BID shall be awarded for:

- Price; and
- Specific Goals through Direct preferencing, as specified b) below.

b) The points for this BID are allocated as follows:

POINTS

i) Price

Rand value of above R 1 000 000 90

ii) Direct Preferencing **90/10**

B-BBEE Status Level of Contributor

PREFERENCE (B-BBEE Status Level of Contributor)		**10**
• Level 1	10 points	
• Level 2	9 points	
• Level 3	8 points	

• Level 4	5 points	
• Level 5	4 points	
• Level 6	3 points	
• Level 7	2 points	
• Level 8	1 points	
• Non-compliant contributor	0 points	
PREFERENCE (B-BBEE Status Level of Contributor)		**10**

TOTAL POINTS

100

APPENDIX E: STANDARD EMAIL SENT TO CONTRACTORS

Dear contractor

My name is Fate and I am working on a contractor development programme with the University of the Witwatersrand (WITS). The programme we are trying to develop is focused on developing and empowering black-owned construction companies. As part of the research, we require assistance with some information from you as a contractor. Could you please assist by emailing me a list of work you have done with the corresponding contract value, company/organisation name and scope of works (COMPANY PROFILE AND CVs).

Your assistance in this research will be highly appreciated. I would also like to highlight that the findings of the research and the development of the project will be highly beneficial to the advancement of the construction industry, black-owned businesses and the development of policy by government bodies in South Africa in the favour and best interest of businesses such as yours.

The information we are requesting will be treated with the utmost respect and confidentiality. You are welcome to contact me (call or email) should you have any questions regarding this email and any concerns.

Regards

Fate Mohlala
074 2341944/0714615863
Email: fatemohlala@yahoo.com

APPENDIX F: CONTRACTOR COMPANY EXPERIENCE

Contractor 1

Project Category	**Number**
Water resources	5
Road works	5
Fencing	1
Livestock infrastructure	0
Structures, concrete works, civil works, earthworks	0
Cleaning services	0
Supply and delivery	0
Total	**11**

Contractor 3

Project Category	**Number**
Water resources	0
Road works	1
Fencing	0
Livestock infrastructure	0
Structures, concrete works, civil works, earthworks	3
Cleaning services	0
Supply and delivery	0
Total	**4**

C**ontractor 6**

Project Category	**Number**
Water resources	1
Road works	7
Fencing	2
Livestock infrastructure	0

Structures, concrete works, civil works, earthworks	5
Cleaning services	0
Supply and delivery	0
Total	**15**

C**ontractor 7**

Project Category	**Number**
Water resources	13
Road works	2
Fencing	2
Livestock infrastructure	2
Structures, concrete works, civil works, earthworks	0
Cleaning services	0
Supply and delivery	0
Total	**19**

C**ontractor 9**

Project Category	**Number**
Water resources	2
Road works	0
Fencing	0
Livestock infrastructure	1
Structures, concrete works, civil works, earthworks	1
Supply and delivery	4
Cleaning services	0
Total	**8**

C**ontractor 15**

Project Category	**Number**

Water resources	3
Road works	0
Fencing	0
Livestock infrastructure	1
Structures, concrete works, civil works, earthworks	0
Cleaning services	3
Supply and delivery	0
Total	**7**

C**ontractor 17**

Project Category	**Number**
Water resources	2
Road works	0
Fencing	3
Livestock infrastructure	0
Structures, concrete works, civil works, earthworks	3
Cleaning services	2
Supply and delivery	3
Total	**13**

C**ontractor 20**

Project Category	**Number**
Water resources	2
Road works	6
Fencing	0
Livestock infrastructure	0
Structures, concrete works, civil works, earthworks	2
Cleaning services	0

Supply and delivery	0
Total	**10**

C**ontractor 21**

Project management

Civil engineering work

Agricultural engineering

Supply and delivery

APPENDIX G: CONTRACTOR CIDB GRADING WITH THEIR RESPECTIVE DEGREES OF DELAY

Project	Contractor	DoD (%)	CIDB grading
1	Contractor 1	133	5CEPE
2	Contractor 2	200	3CE PE
3	Contractor 3	∞	1GB PE/4CE PE
4	Contractor 4	333	2GB PE
5	Contractor 5	100	1GB PE/1CE PE
6	Contractor 6	25	7CE PE/6GB PE
7	Contractor 7	71	5CE PE/4GB PE
8	Contractor 8	∞	1CE PE
9	Contractor 9	200	1CE PE
10	Contractor 10	350	4GB PE/3CE PE
11	Contractor 11	300	7GB PE/7CE PE
12	Contractor 12	100	5CE PE/1GB PE
13	Contractor 3	420	1GB PE/4CE PE
14	Contractor 13	300	1GB PE/3CE PE
15	Contractor 14 JV contractor 15	75	Contractor 14: 7CE PE/6GB PE Contractor 15: 1GB PE/5CE PE
16	Contractor 16	∞	7GB PE/7CE PE
17	Contractor 17	33	5CE PE
18	Contractor 18	533	6GB PE/6CE PE
19	Contractor 19	150	7CE PE/7GB PE

Project	Contractor	DoD (%)	CIDB grading
20	Contractor 19	50	7CE PE/7GB PE
21	Contractor 7	267	5CE PE/4GB PE
22	Contractor 20	300	6CE PE
23	Contractor 21 JV Contractor 22	100	Contractor 21: 1CE PE Contractor 22: 5GB PE/6CE PE
24	Contractor 23	∞	7CE PE/7GB PE
25	Contractor 11	100	7GB PE/7CE PE
26	Contractor 7	133	5CE PE/4GB PE
27	Contractor 14 JV contractor 15	100	Contractor 14: 7CE PE/6GB PE Contractor 15: 1GB PE/5CE PE
28	Contractor 24 JV Contractor 25	∞	Contractor 24: 2CE PE Contractor 25: 7CE PE
29	Contractor 21	67	4CE PE
30	Contractor 11	67	7GB PE/7CE PE