PERFORMANCE ASSESSMENT OF INFRASTRUCTURE AND HOUSING CONTRACTORS IN BUFFALO CITY

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PERFORMANCE ASSESSMENT OF INFRASTRUCTURE AND HOUSING CONTRACTORS IN BUFFALO CITY

By

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ABSTRACT

It is evident that contractors in Buffalo City Metro Municipality are not successfully executing the projects appropriately. The effects can be a result of factors contributing to poor performance. Expenditure trends tell a frightening story in relation to the performance of the contractors as the main spenders on capital and operating project budgets. The municipality is faced with projects that have time and cost overruns, poor project implementation and total abandonment. There is no proper performance measurement instrument in place; as a result, the council struggles to terminate poor performing contractors. This study focuses on key performance indicators that can be employed by the municipality to measure performance of contractors and evaluate progress. Also this study outlined the factors affecting contractor performance during construction so as to understand the effects of these factors on the performance. A questionnaire was utilised to collect information from construction stakeholders. In order for contractors to improve their overall performance, focus should be on construction time and cost. Clients must improve on speed of decision-making during construction.

Keywords: Contractor performance, Key performance indicators, performance factors.
DECLARATION OF ORIGINALITY

I, Thomakazi Thobeka Ngqinambi, declare that:

The treatise hereby submitted by me for the degree: Masters in Business Administration (MBA): Business School at the Nelson Mandela University is my own individual, independent work which I have not been previously submitted to other academic institutions. I, delightfully cede copyright of the treatise in favour of the Nelson Mandela Metropolitan University.

This treatise is an outcome of my own independent work and knowledge in the construction industry. I have worked as Senior technician in the private sector for a consulting engineering firm and currently as a Senior Project Manager.

Referencing has been done to acknowledge work of the writers and has been documented accordingly.

Signed: __________________________ Date: 28 March 2018
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CHAPTER ONE
SCOPE OF THE STUDY

1.1 INTRODUCTION

During the apartheid regime local governance framework was designed to provide quality services for the privileged minority and to systematically exclude the majority of citizens from owning land in urban areas and accessing basic socio-economic services. The current democratic government embarked on a transitional process towards developmental local government that aimed at establishing a more participatory and inclusive system of municipalities, and also reform and strengthen the administrative capacity of municipalities, in order to address the apartheid legacies of spatial segregation, inequality and poverty (Outcome_No_8, 2014).

In order for government to achieve the economic growth through development of local government, the first and the important initiative was to entrench the Constitution substantial powers within the functions of municipalities. The primary function of local government is the provision of infrastructure to support the delivery of socio-economic services and government expenditure. National treasury is supporting municipalities through grant funding in order to have the fiscal capacity to carry out mandated functions. The main revenue sources are property rates and user fees on water, electricity and sanitation services provided by a municipality (Gazette No 40610, 2017).

Service delivery is therefore the primary function of government entities including the local authorities which are municipalities. There are various issues confronting services delivery especially in infrastructure development, also previous studies have mainly focused on skills, funding, government structures and polices and factors affecting services delivery. In this study, contractors are identified as the key stakeholders of service delivery and the focus will be on performance (Ovens, 2015).
1.2 STATEMENT OF THE PROBLEM

Buffalo City Metro Municipality is a contributor to the countrywide housing backlog, based on various challenges that are associated with housing delivery such as land scarcity and suitability in urban areas of the Metro, also the expanding informal settlements within the city. It is possible that deceleration of housing delivery programme can be attributed to construction ineffectiveness and various issues that attributes to poor performance by the contractors. The construction process can be successful through numerous challenges are encountered. This then, contributes to the high project overrun and over expenditure accompanied by defective construction works in most cases. This problem is impacting negatively upon the delivery of the human settlement project, through under-expenditure and sub-standard constructed infrastructure.

The problem is that there is a disjuncture on project planning and the actual project outcomes which is created by the uncertainties on project performance by contractors in the Buffalo City Metro Municipality (Pillay, 2017). The problem extent is such that, budget is spent irregularly, either under or over expenditure. The municipality has a national pre-set targets outcome for each financial year. Mostly the municipality’s housing projects do not reach the Target as set. The extent of the problem is shown in the following graphs. Table 1.1 indicates non-financial performance for the last four financial years.

Table 1:1 Non-financial Buffalo City Metro Municipality projects performance

<table>
<thead>
<tr>
<th></th>
<th>2012/13</th>
<th>2013/14</th>
<th>2014/15</th>
<th>2015/16</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Targets</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOP STRUCTURE</td>
<td>709</td>
<td>1081</td>
<td>1500</td>
<td>1700</td>
</tr>
<tr>
<td>INFRASTRUCTURE SERVICES</td>
<td>900</td>
<td>2396</td>
<td>1700</td>
<td>1961</td>
</tr>
<tr>
<td><strong>Achievements</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOP STRUCTURE</td>
<td>159</td>
<td>1078</td>
<td>1254</td>
<td>936</td>
</tr>
<tr>
<td>INFRASTRUCTURE SERVICES</td>
<td>0</td>
<td>1729</td>
<td>1131</td>
<td>838</td>
</tr>
</tbody>
</table>

(Source; BCMM integrated development plan)
Non-financials are the targeted and achievable deliverables of construction in terms of the internal engineering services provided per site including, water supply, sewer lines and connections, roads (streets), stormwater and drainage system. Non-financials for top structures refers to the complete house structure, fully complying and ready for occupation. These deliverables are classified according to the funding structure, where top structure are funded under Human Settlement Development Grant from the department of Human Settlements (provincial) and the internal engineering services is funded under Urban Settlement Development Grant with is sourced from National treasury. They are both conditional grants in relation to expenditure and handling. If non-performance is considered as not achieving the targeted expenditure, the following results can be seen for the last 4 years.

*Figure 0:1 Non-financial Buffalo City Metro Municipality projects performance (Source; BCMM integrated development plan)*

The performance for both grants over the last four years is shown in Figure 1.1. Buffalo City Metro Municipality’s targets are set based on the funding that National treasury gazetted per financial year. Figure 1.1 shows the targeted deliverables and achievements for each financial year. The trend seemingly since 2012/2013 financial year has been non-achievement for both top structure units and infrastructure serviced sites. The performance on the Provincial Grant will be discussed now in more detail and is show in Table 1.2.
The output (being the houses constructed or engineering serviced site) are outputs of the contractors and are therefore display the performance of the contractors and the managers from the Municipality who monitor and control them. The municipality managed to closely achieve the target on top structures for 2013/14 financial year only. The deviation percentage decreased over the first two years and then sharply increased over the last two years.

Table 0:2 Target, actual and Cumulative (Source: Author)

<table>
<thead>
<tr>
<th>Target</th>
<th>709</th>
<th>1081</th>
<th>1500</th>
<th>1700</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deviation</td>
<td>-159</td>
<td>-1078</td>
<td>-1254</td>
<td>-936</td>
</tr>
<tr>
<td>Cumulative deviation</td>
<td>550</td>
<td>3</td>
<td>246</td>
<td>764</td>
</tr>
</tbody>
</table>

The cumulative increase over the total period show how dramatic performance has decreased over the whole period.

Figure 0:2 Cumulative deviation (Source: Author)

According to these service delivery figures, the municipality can be classified as being a poor performer in delivery of services to the communities of Buffalo City. The budget and expenditure for projects of Buffalo City Metro Municipality is shown in
Table 1.3 and figure 1.3 below. A budget review is done quarterly where the municipality must at least achieve 25% of pre-set targets per quota. The review is determinant of National Treasury for the municipality to be at 100% of expenditure by the end of the financial year.

| Table 0:3 Financial BCMM projects performance (Source; (IDP-BCMM-2017/18, 2017)) |
|---------------------------------|-----------------|-----------------|-----------------|-----------------|
|                                 | 2012/13         | 2013/14         | 2014/15         | 2015/16         |
| **Budget**                      |                 |                 |                 |                 |
| Top Structures                  | R 142 048 979.00| R 200 284 488.00| R 111 827 541.00| R 478 557 630.00|
| Infrastructure Services         | R 56 374 253.00 | R 96 293 158.00 | R 90 136 108.00 | R 116 874 000.00|
| **Expenditure**                 |                 |                 |                 |                 |
| Top Structures                  | R 24 182 174.00 | R 23 671 086.00 | R 196 627 080.56| R 198 204 264.00|
| Infrastructure Services         | R 16 299 326.00 | R 58 763 647.00 | R 144 783 253.00| R 203 042 917.00|

Figure 1.3 show very low expenditure patterns, especially for Top structures in 2014/15 financial year. The situation is such that, either the municipality is over spending or under spending the budget.

*Figure 0:3 Financial Buffalo City Metro Municipality projects performance*

This is not a good expenditure outcome for the municipality, as Nation Treasury can lose confidence in the newly formed metro. According Buffalo City Metro Municipality
Chief Financial Officer, Mr Vincent Pillay, the impact of these expenditure trends is determined by SALGA, COGTA and National treasury to be mismanagement of funds or poor planning (Pillay, 2017). Since 2013/14 financial year the roll-over of unspent funds from previous year to the next was discontinued by treasury. This means that, all unspent funds are inaccessible and unavailable for the expenditure of the following financial year. This perception is also impacting on further accreditation of the metro by the statutory bodies, hindering therefore the growth compared with other metros (Pillay, 2017).

According to Buffalo City Metro Municipality’s Petition Committee protests of communities against slow processes in service delivery were rising to maximum four protests per month from different communities within the jurisdiction of the Metro. There was a decrease in the quality standards delivery of the contractor, leading to defective infrastructure and housing units, delay costs, litigation process, high scope variation, over expenditure and negative audit findings (Mlotana, 2016).

Amongst other challenges that are faced by the metro in housing delivery is the high contestation of the tenders by the contractors as they view the five-year-old metro as a market in terms of service delivery and funding expenditure, according to the Head of Buffalo City Metro Municipality’s Legal services section. These contestations lead to vigorous court cases, resulting to projects being stalled with no expenditure incurred (Mlotana, 2016).

1.2.1 Sub-problems

The sub-problems are;

Identify the KPI’s which are a measure of a contractor’s performance?

Which factors influence the performance of contractor?

Establish the relationship between factors influencing performance and the actual performance achieved?
1.3 DELIMITATION OF THE STUDY

The proceeding section provides details of the delimitations of the study. It includes geographically related delimitations together with some study delimitations.

1.3.1 Geographical delimitation

The area of research in this study was limited to Buffalo City Metro Municipality jurisdiction. Contractors to be assessed in this study were working countrywide, but the performance assessment which is of interest was that of human settlements projects within Buffalo City Metro. The human settlement development is mainly the responsibility of the Provincial Department of Human Settlement, which funds all the projects relating to human settlement in the Province at large. There are projects which the provincial department implements on behalf of the metro and which are within the jurisdiction of the metro. The study therefore was focusing on all project done within BCMM jurisdiction including those that were implemented by Provincial Department of Human Settlement on behalf of BCMM.

1.3.2 Study delimitation

The study only evaluated the performance of contractors on human settlements project and not the performance of managers of the municipality.

The population of the study combined all the Project Managers, Contractors and Professional teams currently working on human settlement projects for the metro. The management of the municipality and that of the provincial department of human settlements were only respondents to obtain input on the performance of the contractors.

1.4 AIM OF THE STUDY

The aim of this study was to evaluate the performance of contractors on human settlement projects. This study was triggered by the imbalances in the municipal expenditure patterns for infrastructure delivery. The expenditure was affected negatively more on projects that have contractors appointed than those on procurement. On the other hand, protests of communities against slow processes in service delivery were rising. Technically, it emerged that there was a decrease in the quality standards on delivery by the contractors, leading to defective infrastructure
and housing units, delay costs, litigation processes, high scope variation, over expenditure and negative audit funding (Enshassi, Mohamed, & Abushaban, 2009).

1.5 OBJECTIVES OF THE STUDY

The aim of this study was to contribute towards improving systems of contractor performance assessment during construction. As construction is the main contributor towards on expenditure of grant funding provided by national treasure to the metro, a proper monitoring and evaluation performance system is essential. To achieve the above-mentioned primary objective, the following secondary objectives were formulated:

Conduct an extensive literature review on performance assessment of contractors.

Determine the performance of contractor’s based on their KPIs.

Determine the factors influencing the performance of contractors.

Determine the relationship between factors influencing performance and the actual performance.

1.6 RESEARCH QUESTIONS

The deceleration of housing delivery programme can be attributed to construction ineffectiveness and various issues that contributes to poor performance by the contractors. Mostly, deceleration can be attributed of process in funding sourcing for the contraction by the municipality and relevant Memorandum of Understandings. This then, contributes to the high project overrun and over expenditure accompanied by defective construction works. This problem is impacting negatively on the delivery of the human settlement project, through under-expenditure and sub-standard constructed infrastructure. The research will be based on following key questions;

- What is the performance of contractors based on their KIP’s?
- Which factors influence the performance of contractors?
- What is the relationship between the performance of contractors and the factors influencing their performance?
1.7 DEFINITION OF CONCEPTS

In the following section, the researcher provides definitions of the key concepts applied to this study.

**Performance of contractors**

According to the Government Gazette No 39074, Contractor performance incorporates the measurements of time, cost, quality, health & safety and site management condition. Contractor performance can be defined based on construction cost, construction time, and construction quality in consideration of the perspective of the accomplishment of one component of performance should not be at the expense of another (Parmenter, 2015). Other definition of contractor performance is perception based on previous project performance, commitment towards client satisfaction, time performance, management of subcontractors, and number of variations during construction (Enshassi, Mohamed, & Abushaban, 2009). Factors bring about change in performance.

**Key performance indicator**

Key performance indicator is a countable or quantifiable tool or instrument an organisation may employ to determine how good or poor on operational and strategic goals attainment and also identify factor affecting performance (John, 2017). This can mean that different business methods and nature have different KPIs considering the different respective performance criteria or priorities.

The following are key performance indicators:

*Scope Variance* is a deviation from a pre-determined scope of works during construction, which alternately affects the construction cost (Fleming, 2007). Conceptually, scope variance relates to various factors such as design defects, criteria changes, unforeseen conditions, site conditions, site conditions, and client’s change of decision (Enshassi, Mohamed, & Abushaban, 2009).

*Construction Cost* is an expense incurred by a contractor on major activities and resources during construction, such as employees, material, equipment, including
overheads and contractor's profit (Xiao, 2013). Conceptually, construction cost refers to design effect based on the level of service measured between basic level services to high level of service (Enshassi, Mohamed, & Abushaban, 2009). Other factors of construction cost are escalation cost and economical status as well as the variation orders (Ali & Kamaruzzaman, 2010).

_Construction Predictability_ is an approximation of the possible cost of construction which is aligned with design quantities that are pre-determined (Kampouridis, 2013). Conceptually, construction prediction can be defined as concept of estimating the major aspects of the project such as, Material, Labour in numbers and in cost, plant, time and the actual construction cost.

_Client satisfaction_ is a marketing term that measures how the products or services supplied by a company meet customer's expectation in all aspects including quality, safety, time and cost.

_Construction Defects_, can be defined as a failure of a building structure during or after construction. These defects range from cracks to major deformation of the structure (Gorse & Johnston, 2013). Conceptually construction defects can be defined as the inadequacies on the construction product in reference to the design type, material supplier, execution process and product quality.

_Construction productivity_ refers to the impact by the lack material (financially and by supplier), incomplete drawings, inspection delays, incompetent supervisors, instruction time, lack of tools and equipment, poor communication, poor site conditions and rework (Makulsawatudom, 2011).

_Construction period/time_ means the contractual time period calculated from the Commencement Date up to the contractual date for completing all of the Works. The Construction Period includes the contractual mobilization and execution of the works to completion, but not the Defects Liability Period. Conceptually, construction period/time refers to the effect of delays which are related to the various factors such as, engineers, design, equipment, labour, material, client and project factors.
1.8 LITERATURE REVIEW

In this study contractors were identified as key stakeholders that accelerate service delivery which contributed to government expenditure. The performance of these contractors were important in support of expenditure and infrastructure delivery.

The literature review of this study focused on outlining the selected key performance indicators for evaluating the levels of performance and to outline factors affecting contractor performance. A basic outline of the framework for analysis is shown below on figure 1.4
This study entails the identification of seven contractor’s key performance indicators and an evaluation the factors affecting contractor performance. An extensive review was done on these factors so as to identify the link between the KPI’s and the factors affecting the performance and finally to develop a framework for contractor selection during procurement with a framework for measuring contractor performance.

1.9 RESEARCH DESIGN

In this study a quantitative research design was utilised which involves a numerical process of counting and measuring the situations. This method of research is based on measuring and exploring statically the objective truth that can the resolve the research problem (Chenail, 2011).
1.9.1 Research area and research population

Based on the context of the study, there is a wide range of affected parties. The study shall focus on Buffalo City Metro Municipality infrastructure and housing projects. The study therefore is based on the built environment as can also be described as a construction industry study. The built environment can be defined as a multidimensional, techno-socio-economic system comprising physical components (such as, healthcare facilities, schools, bridges, roads, residential buildings), and the institutional, management and operational relationships among these components and the society they serve. The main focus is on the assessment of how contractors are performing on human settlement projects.

1.9.2 Methodology

The main focus is on the assessment of contractors’ performance on human settlement projects. The respondents of the study will be all stakeholders of the project, client, contractor, funder, professional team personnel, and community representatives.

Random sampling was used to select the contractors and purposive sampling was used to select the managers and professional staff involved.

A questionnaire was developed using statements anchored to both nominal and interval measuring scales. The questionnaire also included questions anchored to open-ended scales.

The interviews were structured, where the researcher asked questions from the questionnaire. The advantage of this method, is that it is flexible, the interviewer had the liberty to explain unclear questions to the interviewee to obtain reasonable accurate answers (Collis & Hussey, 2014) and probe for more in depth information.

On receipt of the questionnaires for statistical analysis, a statistician services will be employed to assist with the data analysis. The measuring instrument for this study will be based on the understanding through a questionnaire and interviews. The Cronbach alpha indicator were used to test for reliability indicates the overall reliability of a questionnaire. (Field, 2009).
1.9.3 Reliability validity and objectivity

The measuring instrument for this study will be based on the understanding through a questionnaire. A questionnaire can be defined as measures of prompting or provoking the feelings, beliefs, experiences, perceptions and attitudes of a sample (Finlay, 2009). This instrument is often a straightforward, clear and pre-determined set of questions intended to harvest unambiguous data to meet a certain requirement for research information about of a relevant topic of study (Collis & Hussey, 2014). The process of obtaining this information from the respondents will be done questionnaire.

1.9.4 Ethical considerations

In this study respondents were informed about the nature of the study so they decided and agree on their own to participate. The data base was available from the municipality and there was no influence towards the respondents to contribute. A transparent and voluntarily process prevailed to ensure that the information obtained was fair and without prejudice.

Confidentiality in this study was applied to protect the respondent’s identity. It should be noted though that respondents were not be forced to reveal private information.

1.10 SIGNIFICANCE OF THE RESEARCH

The municipality as local government has a duty of providing basic services to poor urban citizens, to satisfy their basic needs. The implementation or construction process is providing these basic services. All the important elements that contributes to effective service delivery are subject to scrutiny to eliminate bottlenecks. The performance of the contractor is also an important factor that needs to be monitored continuously so as to contribute to service deliverables.

This study is therefore important for the municipality to utilise lesson learnt and for future reference on the projects. The Human Settlement provincial department can also utilise this study as policy makers need this information, to improvement the establishment of low cost housing principles and policies. The subsidy amount is drafted and based on the estimated deliverables and the period of implementation.
Therefore, the performance of contractors is a crucial factor in the provincial and even national budgeting process.

The Municipal Integrated Development Plan (IDP) department can also utilise this study to align the municipal five-year plan with the actual process on the ground. This shall assist in evaluating the impact on the service delivery and also set a path for future planning. The IDP department sets targets for the municipality of the services to be delivered in each year. These targets are utilised as a business scorecard of the municipality, which is evaluated monthly for quarterly benchmarking. Municipal departments depend entirely on the service providers in achieving these targets, this means that the performance of the contractors in particular is important in contribution to municipal business scorecard. This performance assessment can be utilised as a setting stone for estimating annual targets, as currently are being estimated through thumb-sucking method with no reference. The municipality always fall short on the set target by IDP, which reflect the poor performance of the implementing departments.

1.11 OUTLINE OF THE STUDY
Chapter 1 entails the scope of the study. This includes the problem statement, research objectives, methodology, definition and concepts and significance of the study.

Chapter 2 entails literature review about the independent variable which are basically the KIP’s in performance measurement of the contractors.

Chapter 3 outlines the research methodology of the study, which includes the research paradigm, sampling method, results analysis method, ethical issues and biasness.

In Chapter 4 the empirical results explained and analysed.

Chapter 5 is the conclusion chapter with in-depth results analysis and recommendations for future studies.
CHAPTER TWO
LITERATURE REVIEW

2.1 INTRODUCTION

South Africa Construction industry is one of the biggest sectors that contributes substantially to the economy of the country in general. This industry serves as the tool to unlock numerous government initiatives such as development at large, expenditure, infrastructure development, curbing unemployment and rendering of services to citizens. Even though the programs of this industry which is mainly construction are short-lived, government depends still on the performance of the contractors in the achievements of goals on the said initiatives. The performance of the contractor is therefore thus vital considering the impact that the industry has on the economy and government development programs. According to CIDB construction monitor, the contribution by construction industry on the South African GDP is estimated at 9% represents 9% of total employment (informal and formal).

It therefore imperative to assess the performance of the contractor as they are the main players in the industry. In this Chapter through a literature review, key performance indicators and factors that affect construction performance was outlined.

2.2 CONSTRUCTION PERFORMANCE INDICATORS (KPI’S)

Performance is a result of a performer be it a group of people or an individual working to achieve a curtain goal (Schechner, 2013). Performance can be described as a journey rather than a destination as commonly referred. The important aspect of this journey is the desired goal which is the level of performance where each level of performance demonstrates the efficiency and quality of performance (Myataza, 2015).

Performance can be defined as the implementation of sequence complicated actions that integrate skills and knowledge to produce a valuable end product or result. This
means that Performance is the demonstration of skill and knowledge in achieving and satisfying contractor objectives and ultimately client’s necessities. It is important for the contractor to then allocate human resource that is skilled and technical for overall performance on projects (Cantens, Ireland, & Revesz, 2014). The performances of key technical staff, skilled manpower together with unskilled workforce positively influence the performance of the contractor throughout the project. Construction cost, time, productivity, client satisfaction, predictability, and defects are key performance indicator selected for this study.

2.2.1 Client satisfaction

Client satisfaction in construction is a function of an estimated, perceived or expected end product quality which is within the stipulated cost and time (Rahman & Alzubi, 2015). Clients being private or public based these perceptions on the comparison with the perceived performance of a construction product with relevant construction standards and regulation that a contractor must adhere to. This means then that, Clients can be fully satisfied when the perceived performance matches the standard contrary to the poor performance whereas Client dissatisfaction occurs when the performance falls short of the standards (Enshassi, Mohamed, & Abushaban, 2009). Client satisfaction can also be viewed as a goal to achieve by the contractor as well as a measuring instrument for construction quality. (Idoro, 2010)

According to various studies, in construction the level of Client satisfaction can only be measured later in the project when most of the expenditure have occurred leaving no space to adjust. Constructors have a sense of attributes of contraction process affect Client satisfaction (Idoro, 2010). Hence many times they draw up a risk management plan to circumvent those attributes from occurring, which are within their control. Client satisfaction can be measured with respect to the performance of contractor’s based on these factors; quality assurance and handover, environment and safety, co-operation, labour, site supervision and subcontracting (Naik, Sharma, & Kashiyani, 2015).

2.2.1.1 Total Quality Management (TQM) in construction
Client satisfaction is an important tool in total quality management (TQM), which is a method that accentuates optimal client satisfaction through the continuous advancement of the products (Ahmad, Younis, Ahmad, & Anwar, 2015). This has always been a method or metric that was widely used in manufacturing industry. Construction companies are starting to adopt TQM to improve their performance, so as to maintain good reputation and competitiveness. Nevertheless, in most instances it is difficult to implement TQM by contractors as there are numerous uncertainties in construction which contributes to inability of accurately determination of Client’s needs which can be easily incorporated to the process of construction (Rahman & Alzubi, 2015). Distortion occurs on the consideration of factor of construction where the contractor has no liberty due to regulations, conditions and specification to consider (Al-Sabek, 2015).

2.2.1.2 Contractor co-operation

Contractor co-operation, in the sense of being able to adapt to the prevailing construction environment, regardless of challenges and maybe hindrances, has an imperative factor on Client satisfaction. Contractor’s ability to cooperate can reduce poor quality assurance that can be identified at completion stage (Abiodun, Segbenu, & Oluseye, 2017).

2.2.2 Construction Cost

The cost of the project is envisaged due to uncertainties by nature of construction projects (Ali & Kamaruzzaman, 2010). There many factors that affect the cost of construction, which always become detrimental to the contractor in terms of cost performance measure as a result of cost overrun. Most projects suffer cost overrun due to factor that are not in control of the contractor, but should be effected by the contractor (Ali, Al-Sulaihi, & Al-Gahtani, 2013). Cost overrun can be classified as a frequent occurrence in construction industry which impact negatively on cost performance regardless of the factors that led to cost increase (Hunt & Siddiqi, 2015). The consequences to this effect are enormous, and has a potential to confits the Client and the Contractor. These conflicts emanate from scope variation and addition works (Ibrahim, 2013).
Contingency amount allowance is pre-set mitigation measure that can cover cost of eventualities (Larsson & Darvik, 2010). In most cases scope variation exceeds the contingency amount resulting to cost overrun (Larsson & Darvik, 2010). The Contractor is subject to poor cost performance for both profit and Client perception. The factors contributing to cost performance are detailed below;

2.2.2.1 Designs

Engineering designs inform the cost of the project as the details of the development are entailed on the designs in detail (G´omez-Mart´inez, Cabero, & Merseguer, 2014). This means that designs have a direct effect on the construction cost, quantities are drawn from the designs regardless of the nature or the size of the project. It can be noted though that, substandard designs or ambiguous specifications can lead to cost overrun (Haseeb, Xinhai, Bibi, Dyan, & Rabbani, 2011). Depending on the accuracy of the designs and maybe innovative ideas, design can be such that the project is completed without variations. Scope variations and some construction challenges are as a result of design defects which maybe have originated from design process (Abiodun, Segbenu, & Oluseye, 2017).

2.2.2.2 Escalation cost

Some of the prevailing factors that poses risk in the construction industry includes economic factors such as fluctuations in the costs of fuel, labour, equipment, materials and police decisions (IDC, 2017). The bidding offer can also be affected as there are cost in the long run of the project can increase due to these uncertain economic conditions (Myataza, 2015). The means then that the profit that can identified post project can be affected by the economic conditions impacting on the project cost. It should be noted though possible, on fixed price project or on project that have no allowance of escalation contractors may suffer losses on profit as possibly there could be increase on most elements of the project (CIDB 2. , March 2017). It is vital that the price escalation must be included in the bidding schedule to circumvent the frustrations of high cost a contractor can be exposed to. In order to reduce the risk of unexpected price increase. As outlined above, the price
adjustment is a necessity, so it also then contributes to the increase of the project as a whole (Ali & Kamaruzzaman, 2010).

2.2.2.3 Variation

Variation means change in any aspects of the project, being change in scope, specification, construction duration, or even construction method (Haseeb, Xinhai, Bibi, Dyan, & Rabbani, 2011). This change influences variation of the original scope of works, construction time and cost. Construction projects by nature they are subjected to these variations, which impacts on the cost negatively or in a positive way where there are savings (Ibrahim, 2013). The cost effect of these variations on the project result on either poor or good financial performance of a construction project.

2.2.3 Construction Time

A construction project is considered successful only if it is completed on time, within budget, in accordance with the specifications, and to client’s satisfaction, which is referred to as construction period is directly proportional to construction cost, due to the consideration of time-based-costs (Abiodun, Segbenu, & Oluseye, 2017). This then makes these two indicator to stand out from others and as critical issues that adversely affect project delivery as well as the contractor performance. Time overrun result from schedule delay factors that arise during construction, where a contractor would apply to the client for an extension of time, with or without cost (Musa, 2012). Some researchers have highlighted factors that affect construction period which includes, addition on project scope, inclement weather conditions, design errors and omissions, unexpected site conditions, and some factors that has a potential to delay the project.

2.2.3.1 Project delays affect time performance

Construction projects varies in size, duration, objectives, uncertainty, complexity, but they are all subjected to delays (Sweis, Bisharat, Bisharat, & Sweis, 2014). Delay means temporal stagnation of the items of project which in the end contributes to
non-completion of the project within the stipulated construction period. The
construction program serve as a guide for a sequence of events with are based on
time, and sometimes are dependent on other’s completion in order to be
implemented. This means then that a construction program on a project plays a key
role in time management due to its influence on project success. Delays are
inevitable most of the time during construction as major time factors are not in
control of the contractor (Weick K, 2012). The effect of delays on a project is that of
time overrun, cost overrun, non-achievements of targets, disruption of work, loss of
productivity, claims, disputes, and stagnation and ultimately project termination
(Xiao, 2013). It can be concluded that delays in construction results to dissatisfaction
to all parties involved, and lead to under performance of the contractor. Also many
studies have highlighted that the main causes of time delay relate to poor planning,
scope variation, and poor labour productivity.

2.2.3.2 Factors affects time performance

**Consultant related factors:** Late inspection or measurement and testing by
consultant. Late approvals of variation on a critical path by consultant. Stubborn and
less innovative of consultant. Poor communication and coordination between
consultant and other parties. Late in reviewing of drawings by consultant. Conflicts
between consultant, sub-consultants and sometimes with the client. Inexperienced
consultant (Abiodun, Segbenu, & Oluseye, 2017).

**Contractor related factors:** Poor project financing by the contractor. Conflicts with
sub-contractors and sometimes with labours. Rework due to defects during
construction. Conflicts between contractor and other stakeholder. Poor site
management by contractor. Poor communication and coordination by contractor.
Poor planning and scheduling by the contractor. Selection of incorrect construction
methods. Poor monitoring of sub-contractors. Poor production by the contractor.
Incorrect sub-contractor employments. Leak of skilled technical employees (Rahman
& Alzubi, 2015).

**Design related factors:** Errors and discrepancies in construction drawings. Delays in
submission of preliminary drawings and design details. Unclear and insufficient
details in the drawings. Complexity of the project design. Insufficient data collection and survey before design. Misinterpretation of client’s project necessities by the design engineer. Less skilled design-team (Akanni, Oke, & Akpomiemie, 2014).

**Equipment related factors:** Equipment breakdowns. Shortage of equipment. Unavailability of skilled equipment-operators. Low productivity and efficiency of equipment. Lack of high-technology mechanical equipment.

**Externality related factors:** Subsurface and surface soil conditions. Delay in obtaining way-leave from municipality. Weather effect on construction activities. Unavailability of utilities on site to connect to at establishment stage. Effect of social and maybe political factors (such as appointment of Project Steering Committee and Community Liaising Officer, Traffic control and restriction at job site, Health and Safety issues, Ground conditions, Changes in government regulations and laws, Delay in performing final inspection and certification by the engineer.

**Labour related factors:** Nationality of labours (foreign or local), Low productivity by labours, Personal conflicts among labours (Rahman & Alzubi, 2015).

**Material related factors:** Scarcity of construction materials in market. Changes in material types and specifications during construction. Delay in material delivery. Damaged material. Delay in manufacturing special building materials. Late purchasing of materials (Patrick, et al., 2010).

**Client related factors:** Delay in progress payments. Delay in handover of the site to the contractor by the Client. Scope change by Client during construction. Delay in approving variations by the client. Poor communication and coordination by Client. Slow decision making process by Client. Conflicts between stakeholders of the project. Unavailability of incentives for contractor for finishing ahead of schedule. Suspension of work by Client (Oyewobi O, A, & Rotimi J, 2015).

**Project related factors:** Short contract duration. Delay in the definition of completion date. Ineffective delay penalties. Type of construction contract. Type of bidding and award process (Younis, 2015).
2.2.4 Productivity

Contractor productivity means deliverable on the project based on the target date and the amount of work done (Xiao, 2013). Labour productivity has an impact on the overall contractor productivity during construction project which may lead to possibly delay for the entire project. There are major factors that according to the National Research Council in Canada, that affect the productivity in construction by the contractor such as, market conditions, Government policy, and poor weather conditions (Jenkins, 2016). Many researches highlights factors that can effect productivity of the contractor in as detailed below.

2.2.4.1 Lack of material

In construction work is dependent on material, equipment and labour, these elements complement each other for the benefits of progress on site. At establishment stage material should be at procurement or at delivery stage, so as to assist with the program of action. The procurement of material is dependent on two elements which are liquidity of the contractor and efficiency of the supplier (Zeb, Malik, Hanif, & Amin, 2015). The understanding is that, if the contractor is financially stable, purchasing of material will be an easy process. In an event where the contractor has negative cash flow, the option is to purchase on credit or through a cession agreement process. If the supplier is not reliable or are over committed it may delay in delivering the material regardless of the payment. This means then that, the lack of material may have a significant negative effect on the project progress and eventually affect the productivity of the contractor as whole (Phu & Cho, 2014).

2.2.4.2 Incomplete drawing

Subsequent to the appointment letter being issued to the contractor by the client, the engineer has a duty to issue construction drawings. These drawing are most of the time a revision of construction drawings (Sveis, Bisharat, Bisharat, & Sweis, 2014).
Failure to issue the drawings on time to the contractor has a potential to delay the commencement of the construction (Naik, Sharma, & Kashiyani, 2015). This mean if the construction is delayed or stalled there can be no productivity that can be recorded. Another drawing issuing process that has a potential to delay production is where there are design variations and it is necessary for drawings to be revised as well. If this process is delayed, the production is having a potential to delay and ultimately delay the critical items on the construction program (Haseeb, Xinhai, Bibi, Dyian, & Rabbani, 2011).

2.2.4.3 Inspection delay

During construction, work should be inspected continuously by control inspectors so that a certification can be confirmed for payment (Younis, 2015). This process includes the monitoring of the progress and productivity on site as well as the management of the cash flow through payment of work done. The contractor depends on this process for immense various aspects of construction progress. This means then that, delay in inspection may lead to delays of construction items dependent on the items that are to be inspected. It is important for inspectors to prioritise the inspection date so as to avoid delays and postponements (BIFM, 2014). The weather can also affect the inspection as, but a determination must be done on the work that has been affected and the defective items (Kikwasi, 2012). Effective inspection system can positively contribute to good productivity of the contractor and also improve the progress on site, as poor inspection can massively delay production of the contractor (G´omez-Mart´inez, Cabero, & Merseguer, 2014).

2.2.4.4 Incompetent supervisors

Incompetent supervisors referring to foreman, team leader and even site agent (Fleming, 2007). This means that if by any chance they do not understand or are less skilled in construction process, the work to be produced will be subject to defects and maybe incorrect executions. This work adversely to productivity, as many items would be subject to re-work (Makulsawatudom, 2011). Also an incompetent supervisor can issue incorrect instruction to the stuff, which would frustrate processes during construction and lead to poor productivity. Also an
incompetent supervisor can sometimes drag processes due to leak of understanding and can even implement inappropriate allocation of tools and equipment. Incompetent supervisors don’t appoint themselves for the job, it is a human resource factor that contractor should be wary of (Min-Yuan Cheng, 2012). A visionary, self-motivated and competent supervisor has a potential to drive productivity through various methods including motivating the stuff and good construction plan for monthly, weekly and even daily plan of action (Li, 2016).

2.2.4.5 Instruction time

Instruction time may course delays based on the fact timing, meaning if the instruction is left till late or towards the commencement of the concerned item, it can influence delays (ALSENDI, 2015). The time factor is adversely on construction production only if the instruction is delayed, but if the instruction is issued on time it can promote and impact positively on production. The timing of instruction which can influence less production can be avoided (Makulsawatudom, 2011). It can just be an occurrence that happens randomly not constantly throughout the project. The instructor, be it the client, or maybe the engineer should be aware of the result outcome of issuing an instruction late. It can also be clarified on the project brief, or at the handover meeting as one of the conditions that all parties involved can adhered to for the success of the project (Oyewobi O, A, & Rotimi J, 2015).

2.2.4.6 Lack of tools and equipment

Productivity depends on tools, equipment and labour, meaning they are major contributors on the progress on site. Without these elements there could be no construction at all on site. Contractor should plan and avail these elements at establishment stage for proper works plan and programming to commence and to also be productive. Financial status of the contractor can also affect the availability or the lack of these elements on site. Also the maintenance of the existing equipment is important to avoid the unavailability (Phu & Cho, 2014).

2.2.4.7 Poor communication
Good communication is important for cooperation, coordination and information sharing in construction (Rahman & Alzubi, 2015). The project team consisting of client, engineers, contractors, and other sub-consultants all need to work together to achieve common goals (Srdić & Šelih, 2011). Through the project life cycle, this team needs to communicate efficiently to resolve issues, share information, and also provide clarity on issues relation to the project. Communication effectiveness is improved by minimizing any misunderstanding or misinterpretation by the different parties. Poor communication is influenced by informal verbal communication in the project, which can be improved through formal documentation issuing or electronical systems such as emails, faxes (Rahman & Alzubi, 2015).

The importance of communication in construction can be clarified as follows. Communication promotes motivation by informing and clarifying to the project team regarding the plan of action, the method of execution, and also how to promote progress for improved construction performance. Communication is a source of information for all stakeholders, project team and affected parties for decision-making process, information sharing and clarity. Communication assists in managing information of the project that is held by the project members, a knowledgeable individual will have a better attitude than a less-informed individual. Communication also helps with the rest of the society in understanding the impact and the importance of the project. It can be concluded that communication assists in controlling processes and hence improve productivity on site (Mohamed, 2015).

2.2.4.8 Poor site conditions

Site conditions depends on the situation or the condition of various projects, based on size of the site, site layout and maybe access. The effects of site conditions may lead to working difficulties and unsafe working conditions on site. If not prevented accidents may occur, which may lead to delays on construction impacting productivity. Productivity is affected by the site of the site in various way, including where there is limited space for construction activities. The lay out of the site has an impact on productivity based on the shape which can reduce working space. Also if the site layout is close to natural features such as the river, mountain and maybe forest, environmental conditions may restrict construction and effect delays that will
lead to poor productivity. Depending on the location of the site, if the access is limited construction vehicles may create traffic that will distort the construction and eventually reduce production (Muiruri & Mulinge, 2014).

2.2.5 Rework

Rework affects time and cost which directly affects production and lead to delay. Rework depends on all project stakeholders; from the contractor perspective it can be due to defects (Bagdiya, 2015). Looking at the client perspective is can be due drastic scope change, as from the engineer’s perspective it can be based on the ambiguous drawing instruction, which contractor misunderstood (Suleiman & Luvara, 2016). Rework can be avoided though given the circumstances. Rework means stagnant productivity as the contractor reproduces instead of proceeding with construction (Makulsawatudom, 2011).

2.2.6 Scope variation

Change is one element that any project is subjected to and the number one element on the project risk plan. In project management change is defined as a modification or variation to a scope of work that shall affect the schedule, time and cost for completing the works (Haseeb, Xinhai, Bibi, Dyan, & Rabbani, 2011). There is cumbersome administration process that is associated with the scope variation which can effect delays. The administration component relates to request, motivation, evaluating, consideration and approval of scope change. Depending on the operations of various organisation involved in the project, including government that use a very bureaucratic process, the administration on its own can create massive delays on the project (Mossalam & Arafa, 2014). It should be noted that variations are different in all aspect of their occurrence including their impact on the project. Other variations are small and seem to be insignificant especial if they don’t have impact on cost, by they may have a bigger impact on the quality outcome. Nevertheless, most variations have the same characteristics and can be classified in common categories. There major factor that lead to variation on the project including, design deficiencies, criteria changes, unforeseen conditions, sometimes site conditions, changes in scope directed by the owner (Niazai & Gidado, 2012).
2.2.6.1 Design deficiencies

Design deficiencies can be referred to as design errors and oversights with may be as a result of incomplete designs that are found or identified during construction by the contractor (Ibrahim, 2013). Generally, in construction mostly in South Africa, contractors tender on designs that are completed so as to manage the cost or the offer, where the designing team is liable for uncompleted designs and is subject to their professional indemnity insurance in relation to the performance (CIDB, 2015). There is an allowance though for the finalisation of design by the designing team during procurement, where some changes may be effected on the construction drawing as revised from the tender drawings (Suleiman & Luvara, 2016).

Unclear, or ambiguous designs may also lead to deficiencies as the constructor would find it difficult to interpret even the specification relating to those designs, attributable to the designer and also are not discovered until the contractor commences with the works. Ineffective quality control by the designing team is one factor that attributes mostly to these design deficiencies (Schlueter & Thesseling, 2009).

On the other side, the Client at times is also liable for design defects, on improper design approvals, the ineffective supply of existing services information, or maybe improper filling of existing engineering services (Hromada, 2014). In some instances, the Client may be subjected to enormous pressure of expenditure where that pressure gets transferred easy to the designing team to complete projects design at unreasonable timeframes, which would affect errors on the designs (Ovens, 2015).

2.2.6.2 Criteria changes

Human Settlements national department each year effect change on the specifications which are referred to as a subsidy quantum (Outcome, 2014). Depending on the timing of the procurement and maybe of the design, those changes must be included in construction as they are attached to the grant funding as part of the expenditure conditions (Pillay, 2017). Most of variation that are identifies may be as a result of these changes on speciation by the national
department. The criteria changes depend on the chosen design conditions or specification that are employed on the project, and also on the prevailing government or construction condition. Issues of sustainability and environment conservations also contributes to the criteria changes. All these factor contribute to scope change and eventually affect time and cost of the works (Bakhareva, Romanova, Talipova, Fedorova, & Shindina, 2016).

2.2.6.3 Unforeseen site conditions

Unforeseen condition occurs when an unknown site conditions of a construction project is uncovered during construction, where the designing team and the Client have no idea on those conditions (Al-Sabek, 2015). These site condition may referee to the natural features of the land to be developed and maybe heritage features such as unknown graves (Black, Henley, & Clute, 2014). Unforeseen site conditions occur mostly when a contractor performs earthworks and excavations that uncovers objects or soil types that were not anticipated and requires extraordinary measures to accommodate. Such occurrences encourage a reasonable scope change, and may be a re-design of the project (Tubbergh-Van, 2012).

2.2.6.4 Changes in scope directed by the client

A client may during construction decide to effect scope change based on various matters including funding, prioritisation of the project, and maybe due to new conditions that a contractor may be subjected to, such as employment and training of local labours (Suleiman & Luvara, 2016). These changes by the Client are not frequent in many project, but they are binding and are controlled even by the designing team as the Client satisfaction is their priority. There must be a willingness though from the Client to fund these changes and also accommodate a possible extension of construction time. By the mere fact that the Client is the owner, change can be lodged at any stage of the project, and must be implemented (Rahman M., 2014).

2.2.7 Predictability/Estimating
There are two types of estimates which are normally utilised for construction, an approximate estimate and detailed estimate. An approximate estimate is a fairly accurate or rough estimate prepared to obtain more or less how much the project will cost prior to the designs completion (Kampouridis, 2013).

A detailed estimate is the cost build-up process of a project which is prepared by determining the quantities from the detail design and costs of all items that a contractor is required to provide including the cost for construction. It is the best and most reliable form of estimate regardless of the escalation costs and economic conditions (Ali & Kamaruzzaman, 2010).

An estimate is important to the Client as it indicates how much the project will cost, provided there are not variation. The Client uses the estimate as a benchmark to evaluate the cost performance of the contractor. Furthermore, an estimate can be used as a tool to for scope variation and budget adjustments during construction (Idoro, 2010).

2.2.8 Defects

Defect on construction projects differ due to their origin or cause also based on the how are they being identified (Bagdiya, 2015). The risk of the defect lies with the contractor’s perception which ultimately can be classified as poor performance by the Client (Hunt & Siddiqi, 2015). Defects relates mostly on quality control, where the contractor has responsibility to construct and deliver a product that is defect free. Minor defects that can be identified during construction can be rectified way before the handover to the Client. This means that, the contractor is limited in managing the defect risk, as minor defects most have minor effects. The worse scenario are major defects which most require re-work and can be known by the Client regardless of the stage of the project (Weick K, 2012).

Client’s perception in relation to defects is that, defect arse a result of poor construction process, procedure, incapable workforce, and maybe poor supply of material and ambiguous designs. All these elements are in the control of the contractor in Client’s view, hence defects are classified as a performance element in construction (Zeb, Malik, Hanif, & Amin, 2015).
2.3 FACTORS AFFECTING PERFORMANCE OF CONTRACTORS

In construction there are conditions in different aspects that contribute to the construction process, such as financial, environment, economic, decision, and industry conditions (Xiao, 2013). Somewhat the performance of the contractor can be affected by these conditions positively or adversely. Furthermore, there are various factors that affect the performance of the contractor during or post-construction and can be classified in different categories (Ahmad, Younis, Ahmad, & Anwar, 2015). Other factors can be categorized as prime factors that relate to client, stakeholders, beneficiary, general public; and various groups with interest in the project. The second category being the professional team and the contractor (Sweis, Bisharat, Bisharat, & Sweis, 2014).

Other studies have identified contractor performance as being affected by project manager's competence and skills, top management support and decision making, monitoring and evaluation, coordination amongst project interest parties, client's competence and understanding, social condition, economic condition, and climate condition (Cantens, Ireland, & Revesz, 2014). This can mean one thing: contractor performance is broad as it comprises numerous factors and aspects. To select the few factors affecting contractor performance and identifying the most relevant factor, nineteen factors were identified for this study as discussed below.

2.3.1 Site management

Site management is mainly the material management and equipment, commitment of site employees, construction monitoring, and communication between parties and thus affects project schedule performance (Dudin M, 2016). Poor site management may cause construction delays as it is the facilitation of construction process on site. Furthermore, poor site management may affect contractor's time performance causing time overruns (Zeb, Malik, Hanif, & Amin, 2015).

Materials and equipment management is an important element in construction process, as the first operational action during construction. It is important to effectively manage construction materials and equipment during construction.
process for a success of the construction project. Performance of the contractor can be affected adversely by the improper management of materials and equipment during site activities contribution to even major cost variances (Neyestani & Juanzon, 2016).

2.3.2 Financing by contractors

Financial status of the contractor has been claimed as the most important resource in the construction process. It is important for contractors to properly prepare a financial planning for the success of project life (Tubbergh-Van, 2012). The financial planning is important to circumvent lack of funds during construction as that can be identified as poor financial performance of the contractor. A proper planning can be such that enough funds are available for the project as a surplus of funds can have an adverse impact, as it is uneconomic (Enshassi, Mohamed, & Abushaban, 2009). Contractors should recognize financial management as long been recognized as an important tool in construction; however, the construction industry suffers the largest rate of insolvency of any sector of the economy (Best & Langston, 2016).

Poor financial management by the contractor is detrimental effect on even cost performance in construction, especially if the cash flow forecasting. Contractors should focus more on cash flow estimation to manage the timing of financial requirements during construction, so as to make sure that the funding is available adequately. Considering the fact that, in construction there are uncertainties and ambiguities at time it is difficult to accurately estimate the cashflow (Xiao, 2013). The Client normally measures the financial performance of the contractor based on the ability to finance the project. If the contract fails to finance the project properly, this can only mean there will be no production on site (Makulsawatudom, 2011).

2.3.3 Coordination among parties

Cooperation facilitated by coordination amongst project team members and also amongst stakeholders can yield a smooth running project with less challenges contributing to project having to be completed on time. Cooperation eliminates
conflicts which may be detrimental to smooth running of the work on site and may altimetry cause time overruns (Li, 2016).

Construction process on its own, has various challenges which can be managed well through communication and dissemination of information. If there is no proper coordination, no communicative environment can be achieved. Nevertheless, contractor cannot be measured by coordination in relation to performance, somewhat, coordination may contribute positively or otherwise to some aspects of performance of the contractor. This means, coordination on projects has contributes to successful outcomes of the project (Mossalam & Arafa, 2014).

Coordination elements in construction, can be defined as a framework of procedures such as detailed procurement plan, resources allocation, task dependencies, meetings and reports, all these contributes to an effective coordination process resulting to a harmonious, conducive working environment (Musa, 2012).

2.3.4 Preparation of program and monitoring

A program is a tool which indicate all activities of construction with relevant time frames and resource attached to them. Program is a primary base for work commencement and maybe the indication of process-built up to the completion of the project. Based on other factor of construction, a program is review timeously (Neyestani & Juanzon, 2016). A program can be utilised as a measuring instrument towards contractor performance especially on time management and completion of various activities. Project monitoring is mostly done through a program, where there is comparison on actual versus what was planned in all aspect of construction including time. Construction period mostly relates to cost, where if the time is exceeded there can be penalties applicable and also if there is addition works time may have to increased and so as the cost (Cantens, Ireland, & Revesz, 2014).

2.3.5 Experience of contractors

Experience of contractors affects technical, management and actual operations of the contractor and somewhat the perceptions in relation to previous work undertaken (Schlueter & Thesseling, 2009). Know-how is regarded as the most reasonable
evaluating element of competency during procurement (Patrick, et al., 2010). There are several benefits that are associated with experienced contractors such as good time management, good quality, adherence to contract regulation and conditions (Gasa, 2012). A contractor which is much experienced maintains a good reputation as marketing positioning amongst other bigger player in the construction industry. Most Clients tend to rely on such contractor for an end result based on safety and meeting Client’s needs on time and cost (Younis, 2015).

2.3.6 Construction methods

During construction, the method of construction is important as it can affect the performance of the contractor positively or otherwise (Turskis, Zenonas, & Šaparauskas, 2012). Contractors should plan accordingly and with an understanding of the site and the end result. Necessary resources may be available but the implementation procedure or method if is improper construction may have defects. Construction method depends on aspects such as, human resource management, site layout and condition, poor selection of proper equipment, and somewhat the execution time (Hromada, 2014).

2.3.7 Experience of consultants

A consultants or a Principal Agents is the driver of the project, as the responsibility of leading the project and the project team rest on them (G´omez-Mart´inez, Cabero, & Merseguer, 2014). During construction, a consultant is expected to be a path-finder for the contractor (Mossalam & Arafa, 2014). Having an inexperienced consultant may impose uncertainties and confusion to the contractor leading to works being executed incorrectly. This would ultimately affect the performance of the contractor significantly (Li, 2016). Construction delays in some cases are as a result of incorrect drawings issued by consultants, leading to scope variations. Anything that relates to scope variation affects either time or cost performance of the contractor (Niazai & Gidado, 2012).

2.3.8 Soil conditions and infrastructure management
Ground investigations are done for most of construction project to determine the threats and determine the mitigation measures. Graves, are a major distraction during construction as a decision of relocation of bypassing depends on affected parties who are not necessary part of the project (Tubbergh-Van, 2012). The decision process then takes longer at times as it relates to Heritage Council and affected parties. Other factor that contribute to poor contractor performance relating to soil condition are, unidentified water table levels, underground poor soil condition, hard rock, and even site layout. These factors have all the potential to delay construction and ultimately impose poor performance of the contractor on time and on cost (Akanni, Oke, & Akpomiemie, 2014).

Old infrastructure, based on old design and plans which are difficult to identify during design stage are identified at times during construction. Local authority or a relevant owner are the consulted at this late stage. This is done to find a resolution on how to accommodate the existing infrastructure and maybe a possible relocation. Same as the graves, this process is cumbersome and can lead to scope variation or additional works on the project. Scope variation and addition works relates to time and cost and then at the end it can lead to overrun of both (Suleiman & Luvara, 2016).

2.3.9 Speed of decision making by client

Speed in decision making by the Client have a significant impact on construction activities. Client should adopt two styles of decision making which is directive and analytic, based on the issue at hand and its nature for a reasonable progress. Slowness in decision making on critical items and activities during construction may lead to construction time and cost overrun (Oyewobi O, A, & Rotimi J, 2015).

2.3.10 Financing by client

It is important to keep financial viability of the contractor during construction through payment at a reasonable time of progress payment certificates for completed works (Phu & Cho, 2014). Insufficient budget to finance the project by the Client and inadequate budgeting may result in delay of payment of the contractor leading to extreme case even shutdowns (Haseeb, Xinhai, Bibi, Dyian, & Rabbani, 2011). That...
would only mean that the contractor did not perform in all aspects of the project (Mohamed, 2015).

2.3.11 Design changes by client during construction

Design variation during construction result in cost and somewhat time variation. Client may influence changes in design during construction for various reasons. The changes can be due to financial implication, where the Client’s priorities are based on the available budget. Also, if certain polices come to effect whilst the project is continuing especially on government projects. Variation of the project can be imposed by all parties involved, but can only be approved by only the Client. Based on the nature of the change to be implemented, the cost increase should be accommodated by the Client (Suleiman & Luvara, 2016).

2.3.12 Experience of the client and skills capacity

In relation to the experience of the Client, most studies that have been done are classifying levels of experience. The first category is Clients who need greater assistance in understanding. The second category is Client with prime experience, where the construction is their main function not necessarily their expertise. This variety of clients affects the methods how the clients interfaces with professionals during all project stages (Idoro, 2010). The risk on the inexperienced Client is the over involvement of the designing team to the extent of advising the Client of the necessities and desired outcome. Also the speed of decision making in affected immensely, as an inexperienced Client need to consult most before making a decision (Oyewobi O, A, & Rotimi J, 2015).

Experienced Clients, relates to all aspects of the project and are clear on what the outcome of construction should be. The category of Clients facilitates the smooth running of the project contributing to good performance of the contractor (Li, 2016).

2.3.13 Project duration set by client

At times project duration is determined by the Client based on priorities and objectives to be attained. Ordinarily, project duration depends on the construction
activities and complexity of the design (Naik, Sharma, & Kashiyani, 2015). Considering that, then it means that it can be complex for the contractor to operate on unreasonable time frames. Client should set timeframes which are aligned with all project aspects. In some cases, contractors avoid to underperform and surrender the work or decline the appointment. (Makulsawatudom, 2011)

2.3.14 Availability of laborers on site

Most of government project are implemented through grants that have strict conditions of local empowerment, training and employment. This program is normally managed at procurement stage (El-Gohary & Aziz, 2014). When the project is going on tender, the tender specification indicates the amounts of local small businesses and local labour to be employed by the contractor. The challenge in implementation of this program is the unavailability of suitable labour to be employed by the contractor. At times contractors are subject to community unrests for local employment, when they bring their own. The responsibility to protect and properly manage the issue of local labour employment resides with the client (Mbeki, 2014).

2.3.15 Availability of staff to manage projects

Skills scarcity is a national problem especially in construction industry. Most of major construction projects are implemented through foreign employment. This is a major challenge during construction as contractors seem to battle to get suitable candidates for various projects. Employing unsuitable and less skilled personnel can lead to numerous problems on site including poor performance in most aspects of the project by the contractor (Mossalam & Arafa, 2014).

Contractors somewhat find it difficult to manage human resource as the industry operates with a diverse personnel on uncertain markets. It is important for contractor to analyse and assess current market opportunities and future markets so as to plan properly in human resource allocation. Human resource planning should relate to the organisation strategy as well organisation financial planning. Over allocation in human resource could lead to major financial loses. However, during construction a
contractor is entitled to claim time lost with cost if delays were out of contractor’s control (Li, 2016).

2.3.16 Availability of equipment

Suitable tools of trade or equipment are a significant resource in construction. Also equipment as a resource should be planned accordingly. Sufficient equipment employed in a project is an advantage, as most of activities depend on correct equipment for construction to proceed (Kikwasi, 2012). It is important to allocate correct and sufficient equipment to circumvent delays and defects that can contribute to poor performance (Sweis, Bisharat, Bisharat, & Sweis, 2014). In relation to health and safety, frequent assessment of equipment is necessary during construction as faults can be identified and fixed at a reasonable time (Muiruri & Mulinge, 2014).

Contractor should be financially ready in sourcing the equipment and its maintenance throughout the project. For a full effective equipment on site, contractor needs to employ skilled personnel that can operate correctly. If everything is fully operational on site, contractor is likely to perform outstandingly (Weick K, 2012).

2.3.17 Availability of material

There are many factors that contributes to material shortages on site including lack of proper supply, insufficient project funding, late submission of drawings, and maybe thief (Abiodun, Segbenu, & Oluseye, 2017). It is vital for contractors to embark on proper material management during construction. This can be done to manage the availability of materials as and when is required for use, with enough quantity and quality. Material management starts at ordering stage, where a proper selection of suitable materials is purchased and delivered on site at a reasonable time (Phu & Cho, 2014). Management of materials can impact on the overall project cost, time and quality. Reasonable productivity can be achieved through a proper management of materials during construction (Zeb, Malik, Hanif, & Amin, 2015).

2.3.18 Availability of site
Mostly in Human Settlements there housing development is referred to informal settlement eradication or informal settlement upgrade. This means that, most of the land earmarked for housing development is occupied by shack dwellers. In Buffalo City Metro Municipality there are hundred and fifty-one (151) informal settlements, with fifty-two thousand six hundred and fifteen (52615) shacks (Scheffers, 2016). When go on tender, an allowance for accommodating the dwellers is done as an item on the bill. Where the contractor will provide temporal shelters with basic services for the dweller to stay till the houses are complete. There are various challenges in that process, as dweller tend to resist to relocate, leading to massive community disputes and unrests. In Fynbos project alone, the municipality was claimed delay time amounting to R20 million as a result of these relocation disputes and resistance. The project was delayed by two and half years, where the contractor could not access the site and commence with the works (Pillay, 2017).

2.4 CONCLUSION

There are many factor that affect the performance of the contractor which as a result of a Client, professional team and even the contractor itself. This mean then that, when evaluating the performance, factor resulting to good or poor performance are important. They contribute directly to performance and in the case of a poor performance mitigations can be employed as a circumvention.
CHAPTER THREE
METHODOLOGY OF THE STUDY

3.1 INTRODUCTION

This chapter entails in detail the research design, methodology, rational of the study sampling method, population, research instrument and data collection method utilised in this study.

3.2 THE FRAMEWORK FOR ANALYSIS

On figure 1.4 of this study, a conceptual framework is depicted. This study is mainly about the assessment of contractor performance within Buffalo City Metro Municipality. The literature review covers factors influencing contractor performance based on seven Key Performance Indicators which were selected on this study for the purpose of assessing performance of contractors. This was done as an attempt to obtain a broader understanding of about factors affecting contractor performance in order to conclude on measures that can be put in place to circumvent poor performance of contractors.

3.3 RATIONALE FOR THE STUDY

Based on the objectives outlined below, the study seeks to obtain an understanding about the level of performance of contractors and identify the major contributors of performance or measurements instruments.

The objectives of the study as outlined in chapter one are;

- To determine the performance of contractor’s based on their KPIs.
- To determine the factors influencing the performance of contractors.
- To determine the relationship between factors influencing performance and the performance.

Local government is highly regulated especially on grant funding, it important to adhere to the regulations relating to expenditure. The source of expenditure in
service delivery is through construction and implementation of capita and operating projects. This study provides an indicative level of contractor performance contributing to infrastructure and low cost development projects. The factors that affects contractor performance will be identified in order to establish a performance improvement instrument for the municipality.

3.4 THE RESEARCH DESIGN

In this study, a quantitative method was used to measure the problem the generation of ordinal scale questionnaire. The instrument was a measurement of contractor performance and factors influencing their performance. The choice of quantitative study was based on the consideration that it allows measuring of data to provide evidence of output of variables and also uncovers trends and relationships (Roller, 2011). Illustration below depicts research design followed on this study.

*Figure 0:1 Methodology Flow Chart Source (Srivastava & Thomson, 2011)*

![Methodology Flow Chart](image)

3.5 TYPES OF RESEARCH

The research type employed in this study is descriptive research for the description of what is in existence and also to exposition of new evidences. The advantage of this type of research is its ability to observe, define, document, all aspects of a circumstances as it actually occurs (Srivastava & Thomson, 2011). The information
in study through this a descriptive study was collected without any alterations on the changing the situation. The desired outcome of this study is to validate associations and relationships between factors affecting performance and the actual performance of the contractors. Also to uncover the actual performance and its factors contributing to either poor or good performance on site. The study findings have assisted in the establishment of performance measurement tool for contractors which shall be utilised by the municipality for assessment and monitoring purposes.

3.6 POPULATION

The population of this study includes professional teams, municipal project managers (Client), contractors, and municipal project funders. There are numerous projects on construction sector for human settlements programs nationally, provincially as we as with the jurisdiction of Buffalo City Metropolitan Municipality. That is a prodder population of the study. Considering that same professional teams and contractor are mostly operating in all aspect of the country, hence the population is so broad.

3.7 THE SAMPLE

The sampling method for this study was the random sampling. Due to the limited number of professional teams and contractor on Buffalo City Metro Municipality’s data base, no sampling was done. Questionnaires were sent to all service providers on the data base, working on Human settlements project within the city. There are 46 professional team working on various projects within the municipality and there are 36 contractors.

3.8 THE RESEARCH INSTRUMENT

The questionnaire was constructed such that the desired outcome is accomplished or the relevant information is obtained with no ambiguities. The questionnaire was made as simple as possible, to encourage the respondents to respond effectively and quickly. The first part of the questionnaire entailed the identification in terms of the discipline or project stakeholder title and the description of a recent or current
project being implemented with the municipality. The second part was the body of the questionnaire with question on interval scale. Open-end questions were also included for the obtainment of other KPI’s and factors affecting no included in the questionnaire.

For both key performance indicators and factors affecting contractor performance, the questions were design based on the five-point nominal scale which measures from 1-5 according to the level as follows;

<table>
<thead>
<tr>
<th>Rating</th>
<th>Very bad</th>
<th>Bad</th>
<th>Reasonable</th>
<th>Good</th>
<th>Excellent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scale</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

3.9 PILOT STUDY

A pilot study was done to five respondents from different disciplines to test if the questionnaire has omissions or errors. Also to check our possible would the respondents receive, understand and respond. No major mistakes were identified, and out 5 only response received. The feedback was considered and the questionnaires revised accordingly. Others were suggestion on methods of sending and receiving questionnaires.

3.10 THE DATA COLLECTION AND PROCESS

A questionnaire has been utilised on this study as a method of date collection, for it is less expensive and allows for collection of information in wider scale. The option on questionnaire is reasonable based on the its practicality. It is a simplest method of asking a question and obtaining a reasonable and response.

3.10.1 Administration of Questionnaires

A self-administration process was adopted for this study as the questionnaires were simple enough to be understood by respondents. The advantage of a self-
administered questionnaire is that mostly questionnaires were emailed to respondents.

3.10.2 Collection of Questionnaires

Questionnaires forms which are completed and returned by respondents were utilised as a method of data collection. The researcher has made a declaration in a form of a letter, giving the respondents information regarding the study. Also an emphasise has been made in relation to the confidentiality of the information given and the respondent’s protection. This is an encouraging or a motivation method towards the respondents, to be able to respond quickly, honestly, and without fear, also to encourage them to partake in this study. The questionnaires are distributed and collected by hand and through email.

3.10.3 Data Analysis

The process of data analysis is a practical application of statistics systematically in order to define and demonstrate, also reduce and assess data. Data had to go through all important data analysis processes including, data capturing and coding, data cleaning, data presentation, data interpretation and data discussion. On data capturing and coding, a spread sheet was created in format that best suits the questionnaire design and the sequence of question. Open-ended questions and comments were captured separately in a non-numerical method and set aside for discussions and conclusions. Data Cleaning was done on captured data for the elimination of errors and elimination of ambiguous features. Data cleaning involved the identification and removal of mistakes and discrepancies in the data captured, which may have been a result of incorrect entries or misinterpretations. Also an incomplete, incorrect or immaterial data was identified rectified accordingly. It is important to conduct a data cleaning as incorrect and inconsistent data can lead to incorrect conclusion being drawn up on the study. Data presentation was done in form of graphs. On chapter four, a detailed data presentation has been done and illustrated in manner that is easy to draw up conclusion and as an answer to the research questions. Data interpretation was done based on the trends identified on
data presentation. The data discussion was the collective summary of the numerical and non-numerical discussion.

3.10.4 Presentation of Results

A broader result presentation is outlined in detail on chapter four of this study. Consideration was done on how the findings was to be organised. Findings were organised in manner that denotes a story told in response to the research questions answered. Therefore, it was important to outline the story in a clear and understandable manner to the reader. Conclusions were drawn up with findings that had adequate evidence from the data. Ethically, findings were discussed to cover all aspects including contradictions, and aligned to the conceptual framework. However, the findings are a response to the problem statement and an answer to research questions.

3.11 CONCLUSION

This chapter entailed the demonstration of study methodology, population, and sampling technique adopted. In detail, the reasons for the choice of methodology for this study as well as the data collection method is also outlined. The presentation of results, data analysis and findings shall be covered in Chapter 4 of this study.
CHAPTER FOUR
DATA ANALYSIS AND DISCUSSION OF FINDINGS

4.1 INTRODUCTION

On this chapter the main focus is on the analysis statistically the outcomes of the research. The analysis of the questions was directed towards answering the research questions concerning the key performance indicators, the factors that affect performance of contractors during construction and the relationship between factors influencing performance and the actual performance. The results are also presented according to the research questions. In outlining the results, tables and charts are utilised to present the results. Furthermore, a consolidation of open-ended questions and comments by the respondents has been done for conclusions and recommendations.

4.2 RESPONSES

The response rate was 77% of 90 questionnaires which were dispersed amounting to 69 questionnaires. According to the sectorial classification there were 9 responses from the client, 25 from contractors, 6 from funder, 26 from professional Team, and 3 from community members.

Research participates were provided with a list of construction industry related sectors to select the relevant sector of their designation, as illustrated in table 4.1 below. All respondents received answered well on this section, with clear indications of which sector they belong to as per the categories of the questionnaire. There were five sectorial categories in the questionnaire namely, Client, Contractor, Funder, Professional Team Member and the Community Member.
Table 0:1 Sectorial participation rate

<table>
<thead>
<tr>
<th>No. of sectors</th>
<th>Sector Classification</th>
<th>No. of participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Client</td>
<td>9</td>
</tr>
<tr>
<td>2</td>
<td>Contractor</td>
<td>25</td>
</tr>
<tr>
<td>3</td>
<td>Funder</td>
<td>6</td>
</tr>
<tr>
<td>4</td>
<td>Professional Team</td>
<td>26</td>
</tr>
<tr>
<td>5</td>
<td>Community Member</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total Number of participants</strong></td>
<td></td>
<td><strong>69</strong></td>
</tr>
</tbody>
</table>

The percentage participation rate as illustrated in figure 4.1 below consisted of Thirty-eight percent of Professional team members, Thirty-six percent of Contractors, Thirteen percent of Client members, Nine percent of Funders and Four percent of Community members.

*Figure 0:1 Sectorial participation percentage(source: author)*

The questionnaire consists of three sections as detailed below, and the data has been generated as such:

- The first section consisted of demographic data such as sector, years of experience and project done with Buffalo City Metropolitan Municipality.
experience, and adequacy of training and institutional support.

- The second section contained data describing factors affecting contractor performance.
- In the third section contained data describing Key Performance indicators for contractor performance assessment.

4.3 METHODS OF DATA ANALYSIS AND PRESENTATION OF DATA

Descriptive and inferential statistical analyses were utilised to identify trends, percentages and relationships of the responses to the research questions. The advantage of utilising these methods are that, it converts raw data into components that can be classified and understood based on the visual and graphical presentation. Descriptive statistics allows for a clear presentation of data in an expressive way that is easy to interpret by the reader and inferential statistical analysis provides the relationships.

4.4 DISCUSSION OF FINDINGS

4.4.1 Demographic Relationships and Study Variables

Demographics are not on the objectives of this study, the purpose of this analysis define demographic features of the sample as well as to evaluate and identify possible influences on the research conclusions. The demographic data comprised of sectorial destinations, years of experience and project undertaken wit Buffalo City Metropolitan Municipality. The questionnaire related to demographics are in section A of Questionnaire (Appendix 1).

The majority of the respondents which is 85%, was found to have over 10 years of experience. Respondents have declared various Human Settlements project that they have worked on with Buffalo City Metropolitan Municipality. This means that responses were not fixated on few project, rather on many of the projects contributing to the expenditure of grant funding in Buffalo City Metropolitan Municipality.
4.4.2 Number of years’ experience in construction project

Respondents were given an opportunity to declare their years of experience in construction projects. Due to various years of experience indicated by respondents, a categorised sequence was adopted during the coding of the questionnaire. This was done to reduce the data into a reasonable amount. A range was created in sequences of ten year intervals, (1 - 9), (10 – 19), (20 – 29) and (30 – 39) as detailed in Table 4.2 below.

Table 4.2: Years of experience

<table>
<thead>
<tr>
<th>No. of year ranges</th>
<th>Years of experience range</th>
<th>No. of participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1 - 9 Years</td>
<td>10</td>
</tr>
<tr>
<td>2</td>
<td>10 - 19 Years</td>
<td>35</td>
</tr>
<tr>
<td>3</td>
<td>20 - 29 Years</td>
<td>16</td>
</tr>
<tr>
<td>4</td>
<td>30 - 39 years</td>
<td>8</td>
</tr>
</tbody>
</table>

**Total Number of participants** 69

Fifty-one percent of respondents had between ten and nineteen years of experience in construction projects, twenty-three percent had between 20 – 29 years, fourteen percent had between 1 – 9 years and twelve percent had between 30 – 39, experience in construction. In the construction industry work experience is very important as it influences the understanding of construction work. In this study seventy-three percent of respondents has between 10 – 29 years of experience, and adding twelve percent of 30 – 39 years amounting to the total of eighty-six percent. The assumption is that years of experience influenced the responses positively based on the in-depth knowledge of respondents. Also the concepts of construction can be assumed to be fully understood by the respondents.
4.4.3 The Performance of contractors based on their key performance indicators (including contractor’s responses)

Key performance indicators which were selected for this study were rated by the respondents on the questionnaire on a Likert scale of being Very bad to Excellent. Generally, all questions were answered by the respondents, only one question which was not answered on Time performance assessment, hence there is ninety-eight percent participation on Time. The general rating of Key Performance Indicator is that Contractors seem to be doing good in these aspects of measurement. The highest and lowest rating as tabulated below on table 4.3
Table 0:3 Key Performance Indicators rating table

Please indicate your opinion on your own performance in respect of the following dimensions for the last project that you did for Buffalo City Metro Municipality

<table>
<thead>
<tr>
<th></th>
<th>Client Satisfaction</th>
<th>Time</th>
<th>Construction Cost</th>
<th>Productivity</th>
<th>Scope Variation</th>
<th>Rework</th>
<th>Defects</th>
</tr>
</thead>
<tbody>
<tr>
<td>A2.1</td>
<td>1.4%</td>
<td>1.4%</td>
<td>2.9%</td>
<td>2.9%</td>
<td>5.8%</td>
<td>11.6%</td>
<td>11.6%</td>
</tr>
<tr>
<td>A2.2</td>
<td>15.9%</td>
<td>39.1%</td>
<td>39.1%</td>
<td>18.8%</td>
<td>20.3%</td>
<td>15.9%</td>
<td>15.9%</td>
</tr>
<tr>
<td>A2.3</td>
<td>20.3%</td>
<td>18.8%</td>
<td>15.9%</td>
<td>17.4%</td>
<td>24.6%</td>
<td>21.7%</td>
<td>23.2%</td>
</tr>
<tr>
<td>A2.4</td>
<td>58.0%</td>
<td>36.2%</td>
<td>39.1%</td>
<td>56.5%</td>
<td>47.8%</td>
<td>50.7%</td>
<td>49.3%</td>
</tr>
<tr>
<td>A2.5</td>
<td>4.3%</td>
<td>2.9%</td>
<td>2.9%</td>
<td>4.3%</td>
<td>1.4%</td>
<td>0.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td>A2.6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A2.7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>100.00%</td>
<td>98.55%</td>
<td>100.00%</td>
<td>100.00%</td>
<td>100.00%</td>
<td>100.00%</td>
<td>100.00%</td>
</tr>
</tbody>
</table>

Assessing the performance of contractors based on seven selected indicators gave an outcome of the situation that is prevailing on Buffalo City Metropolitan Municipality contractors.

Client satisfaction, 58% of respondents have rated contractors as good in this aspect, with 4.3% on excellent, totaling 62.3%. Seemingly in general contractor are constructing to the satisfaction of the client. This may be attributed to the actual completions not necessary on any other aspects. Only 1.4% which is only two respondents rated very bad on this aspect with bad on 15.9% amounting 17.3%. This means there are elements of un-satisfaction which is not so significant, but must be noted with concern. Respondents rated reasonable at 20.3%, meaning it is neither bad but rather good rather acceptable.

Construction time, there were two unanswered questions leading to 98.55% response rate. Respondents rated 39.1% as bad with 1.4% as very bad on construction time totalling of 40.5%. Respondents seemed not to be satisfied with completion time, this can only mean that some of the projects had time overrun. Reasonable completion
time has been rated at 18.8%, this means that contractors are completing just on
time not early neither late. It can also mean that 18.8% of projects adhered to the
contact period as defined in the begging of the project. Good construction time has
been rated as 36.2% with 2.9% as excellent totalling to 39.1%. As outlined above
39.1% was rated bad on construction time. These results depict a scenario of most
of the project not being completed on time.

Construction cost rating is closely rated as construction time. Bad construction cost
has been rated as 39.1% with 2.9% as very bad. This implies that many projects
have an overrun of cost. Even though project have a relatively high client satisfaction
there are elements of cost overrun. On good rating of construction cost respondents
rated on 39.1%, with 2.9% on excellent totalling to 42%. Cost in construction rating is
on 50/50 bases from very bad to excellent. This means contractors perform equally
well and bad in construction cost.

Productivity of contractors has been rated high on good at 56.5% with 4.3% on
excellence totalling to 60.8%. Contractors are performing very well in this aspect
regardless of the cost and time there is a good use of resources. This means no
matter how long and how costly the project may be, but ultimately projects get
completed, and this may influence the idea that productivity is good. On reasonable
productivity contractors have been rated on 17.4%. Contractor productivity has been
rated 18.8% on bad and 4.3% very bad totalling to only 23.1%. The general
consensus of the respondents, are that productivity is good.

Scope variation has been rated 47.8% as good as the highest rating followed by the
reasonable rating on 24%. These results means that projects are relatively scope
defined well, with limited variations. This is a good indication that contractor’s
program does not get disturbed by the variation which can affect time and cost as
outlined in chapter two of this study. On the other hand, scope variation has been
rated 20.3% on bad with 5.8% on very bad totalling to 26.1%. This can only mean
that in some projects scope variation occurred. This is expected as scope variation
depends on numerous aspects from contractor’s to Client related aspects. Based on
the outcome, seemingly scope variation is not a common occurrence in the project.
Rework is rated good on 50.7% with 0.0% on excellent. This indicated that there is less defective work that gets declared as being in a state of demolishing and rework. Rework is time and cost consuming from a contractor’s perspective and may lead to overall poor performance. Reasonable rework has been rated on 21.7% meaning rework depends on various factors which mostly may be out of control by the contractor. In event where the contractor could have been a contributory factor on rework indication would have been high on very bad. This is an indication that rework occurrence had a mutual accountability to all stakeholders of the project. It should be noted though that rework had a very bad rating of 11.6% and bad of 15.9% both amounting to 27.5%. The negative perception of 27.5% is not so significant compared to 50.7% of good rating. In this aspect contractors are performing well.

Defects was rated 49.3% on good with 0% on excellent. The perception of the respondents suggest that projects are less defective. This is a good indication as project with defects can affect Client satisfaction rate. In this aspect contractor seem to be performing well, as the next high rating is reasonable on 23.2%. Contractors on some of the project had reasonable defects which is an expectation on most construction project. A defect that is manageable or is rectifiable can occur on most of projects being influenced by various factors. Very bad rating for defects was on 11.6% with bad on 15.9% combined amounting to 27.5%. There are elements of defective work produced by contractors which are not so significant.

Figure 0:3 Key Performance Indicators rating overall (source: author)
In essence, contractors are performing reasonable to good in all aspects based on the selected key performance indicators. Below is the chart as figure 4.3 showing the individual indicators with relevant performance levels. The highest rated indicator is Client satisfaction on 58% and the work rated are rework and defect on 11.6% simultaneously.

4.4.4 The Performance of contractor’s based on their key performance indicators (excluding contractor’s responses)

![Figure 0:4 Key Performance Indicators rating contractor excluded (source: author)](image)

The overall rating included total of twenty-five responses from contractors, constituting 36% participation. Figure 4.4 depicts results that exclude contractors, for a further assessment on rating of client, professional teams, funder and community members. These responses are not distorted by possible bias rating of contractors when assessing themselves.

Levels of rating are similar to those responses that included contractor’s ratings. The only glaring element is the reduction of percentage rating based on the reduced number of responses. It can be concluded that; contractors are performing well as rated by all participated stakeholders in this study. Contractor’s responses have not influenced the positive response in relating to their performance. In a reduced
measure of responses totalling to 44 responses, the outcome was a good performance rating in all indicators.

4.5 RANKING CLASSIFICATIONS ON KPI’S

The highest rating of all key performance indicators is good which ranges between 36.2% and 58% except construction time and cost. This means that contractors perform well on projects in most of the assessed aspects. The overall performance chart which is figure 4.4 below depicts a scenario of the most highly rated rating. In this case it is good, followed by reasonable, then bad, very bad and lastly excellent. On excellent rating has been rated at 0% on rework and defect with a highest rating of only 4.3%. Contractor’s performance was found to be far from being excellent. On bad rating the highest rating was on 39.1% with contributors being construction time and cost. The rest of the rating are below 21%, meaning that in most aspects contractors are not performing badly.

Bad rating had was rated thirdly with the highest on 39.1% and lowest on 15.3%. Highest contributors on bad were construction time and cost, indicating that project are not completed on time within cost. Other than that bad rating ranges in other aspects between 15% and 21%.

Very bad rating was fourthly rated with the highest being 11.6% and lowest of 1.4%. The indication of these results was that there are less projects that perform very bad. Also excellent which was rated lastly on fifth place had a poor outcome rating ranging from 0% with a highest of 4.3%. There are relatively very few project that are being implemented excellently, in most of the aspects. The 0% rating for excellent on defects and rework means that all projects had performed poor on these aspects. There is not a single project that had no defects and rework.

4.5.1 Ranking classifications on KPI’s

Even though good has relatively high rating on most aspects, the ratings were found to be just on fair-to-average range. This is as a result of other ratings that have received up to a couple of tens of percentages deducting to the total of 100%. The
range of percentages is not evenly spread though; the distribution was reactive as showed on figure 4.5 below.

*Figure 0.5 Overall ranking chart (source: author)*

The general perception of contractor performance turnout to be good, as all indicators were rated on good scale mostly. All stakeholder participated in the study have an optimistic view about the performance of human settlements contractors in Buffalo City. There were two aspects of concern on contractor performance which need a drastic improvement, construction time and cost. All stakeholder should work towards improving these aspects for the success of projects.
4.5.2 The relationship between factors influencing performance and the performance in KPI's

Figure 4.6 Overall between factors influencing performance and the performance in KPI's (source: author)

Figure 4.6 indicates R-Squared as 0.246 and the amount of variation in performance explained by the factors influencing performance. The slope is appositive 0.251 which indicates that as the performance in the factors increase, there is an increase in performance of the KPIs of contractors

4.5.3 Factors affecting performance

In the literature it is outlined how these factors individually impacts on performance. Each factor has its own impact based on the circumstances relating to its occurrence and can be categorised according to the responsible stakeholder. There are factors that Client based, Professional and even contractor based. Some of the factor are bilateral and trilateral to the responsible stakeholders. Out of the seventeen factors influencing performance, were categorised into three stakeholders (client, professional team and contractor), for whom the responsibility lies. The categorisation of factors in relation to the responsible stakeholder is detailed below on table 4.4.
Table 0:4 Categorised factors according to responsible party

<table>
<thead>
<tr>
<th>Please describe how you experienced the following conditions in the last project that you did for Buffalo City Metro Municipality</th>
<th>Client related factors</th>
<th>Professional Team related factors</th>
<th>Construction related factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Site management</td>
<td></td>
<td></td>
<td>√</td>
</tr>
<tr>
<td>Financing by contractors</td>
<td></td>
<td></td>
<td>√</td>
</tr>
<tr>
<td>Coordination among parties</td>
<td>√</td>
<td>√</td>
<td>√</td>
</tr>
<tr>
<td>Preparation of program and monitoring</td>
<td></td>
<td>√</td>
<td>√</td>
</tr>
<tr>
<td>Experience of other contractors</td>
<td></td>
<td></td>
<td>√</td>
</tr>
<tr>
<td>Construction methods</td>
<td></td>
<td></td>
<td>√</td>
</tr>
<tr>
<td>Experience of consultants</td>
<td></td>
<td></td>
<td>√</td>
</tr>
<tr>
<td>Soil conditions</td>
<td>√</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Infrastructure management</td>
<td>√</td>
<td></td>
<td>√</td>
</tr>
<tr>
<td>Speed of decision making by Client</td>
<td></td>
<td>√</td>
<td></td>
</tr>
<tr>
<td>Financing by Client</td>
<td></td>
<td>√</td>
<td></td>
</tr>
<tr>
<td>Design changes by Client during construction</td>
<td>√</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Experience and skills capacity of the Client</td>
<td></td>
<td>√</td>
<td></td>
</tr>
<tr>
<td>Project duration set by Client</td>
<td>√</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Availability of labourers on site</td>
<td></td>
<td></td>
<td>√</td>
</tr>
<tr>
<td>Availability of staff to manage projects</td>
<td>√</td>
<td>√</td>
<td>√</td>
</tr>
<tr>
<td>Availability of equipment</td>
<td></td>
<td></td>
<td>√</td>
</tr>
</tbody>
</table>
4.5.4 Rating outcome of factors affecting performance

The rating outcome of the factors affecting contractor performance are detailed below on table 4.5. Then, followed by the analysis for each factor effect rating results.

<table>
<thead>
<tr>
<th>Table 0:5 Categorised factors according to responsible party</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Please describe how you experienced the following conditions in the last project that you did for Buffalo City Metro Municipality</strong></td>
</tr>
<tr>
<td>Site management</td>
</tr>
<tr>
<td>Financing by contractors</td>
</tr>
<tr>
<td>Coordination among parties</td>
</tr>
<tr>
<td>Preparation of program and monitoring</td>
</tr>
<tr>
<td>Experience of other contractors</td>
</tr>
<tr>
<td>Construction methods</td>
</tr>
<tr>
<td>Experience of consultants</td>
</tr>
<tr>
<td>Soil conditions</td>
</tr>
<tr>
<td>Infrastructure management</td>
</tr>
<tr>
<td>Speed of decision making by Client</td>
</tr>
<tr>
<td>Financing by Client</td>
</tr>
<tr>
<td>Design changes by Client during construction</td>
</tr>
<tr>
<td>Experience and skills capacity of the Client</td>
</tr>
<tr>
<td>Project duration set by Client</td>
</tr>
<tr>
<td>Availability of labourers on site</td>
</tr>
<tr>
<td>Availability of staff to manage projects</td>
</tr>
<tr>
<td>Availability of equipment</td>
</tr>
</tbody>
</table>

4.6 CLIENT RELATED FACTORS

These conditions are normally the result of actions taken by the client. Contractor during construction is subject to numerous factors that can affect the performance in various aspects. Client as the employer in the project has a major role in the success
of the project and the attainment of goals and objectives. Below is figure 4.6 indicating factors that the client is responsible on a project during construction.

Figure 0.7 Client related factors (source: author)

<table>
<thead>
<tr>
<th>CLIENT RELATED FACTORS</th>
<th>Very Bad</th>
<th>Bad</th>
<th>Reasonable</th>
<th>Good</th>
<th>Excellent</th>
</tr>
</thead>
<tbody>
<tr>
<td>SOIL CONDITIONS A1.8</td>
<td>7.25%</td>
<td>2.90%</td>
<td>21.74%</td>
<td>9.42%</td>
<td>59.42%</td>
</tr>
<tr>
<td>SPEED OF DECISION MAKING BY CLIENT A1.10</td>
<td>7.25%</td>
<td>21.74%</td>
<td>21.74%</td>
<td>9.42%</td>
<td>59.42%</td>
</tr>
<tr>
<td>FINANCING BY CLIENT A1.11</td>
<td>7.25%</td>
<td>21.74%</td>
<td>21.74%</td>
<td>9.42%</td>
<td>59.42%</td>
</tr>
<tr>
<td>DESIGN CHANGES BY CLIENT DURING CONSTRUCTION A1.12</td>
<td>4.35%</td>
<td>18.84%</td>
<td>20.29%</td>
<td>7.25%</td>
<td>47.88%</td>
</tr>
<tr>
<td>EXPERIENCE AND SKILLS CAPACITY OF THE CLIENT A1.13</td>
<td>4.35%</td>
<td>15.94%</td>
<td>21.19%</td>
<td>3.90%</td>
<td>53.62%</td>
</tr>
<tr>
<td>PROJECT DURATION SET BY CLIENT A1.14</td>
<td>4.35%</td>
<td>15.94%</td>
<td>5.80%</td>
<td>10.14%</td>
<td>26.09%</td>
</tr>
</tbody>
</table>

4.6.1 Soil conditions

This factor is the responsibility of the client as the land owner. During feasibility study this factor can be avoided through an identification of the features of the land to the actual condition of the site. A rating of 59.42% was received on good with 5.8% on excellent. This was; generally, a good rating meaning work was done to manage this risk on pre-project stage. A reasonable rating received 17.39% followed by 13.45% on bad and very bad on 2.9% rating.

4.6.2 Speed of decision making by client

This factor is the responsibility of the Client only and has a vital impact on the success of the project. All the rating received were found to be way below the average. Very bad in all other factor has been always below 6% which was relatively low, but in this one there is a significant escalation which is exceeds 20%. The
highest rating in this factor is 26.09% on bad followed by 24.64% on good, then 21.74% on both reasonable and very bad. Excellent received a rating of 1.45%. These results indicate that the Client takes had a poor turnaround time on matters of the project during construction. This means then that even site instruction issuing process was slow and most often not on time. This outcome has a bad reflection on how the Client was supporting the construction process.

4.6.3 Financing by client

This factor received highest rating of 46.38% on good, with 5.8% on excellent and 20.29% on reasonable. All of these ratings are below average, meaning that projects were financed just enough to complete the work. The Client is financing projects through grants funding which for each financial year. With conditions attached to the grand funding, the distribution of funding maybe the reason why projects are partially financed. Very bad received a rating of 4.35% with 18.84% of bad. The contributing element for these rating could be the finance for the actual houses. This funding is normally received from the Provincial Department of Human Settlement, where projects are funded based on the available budget, if is depleted projects suspended. The indication presented by the results is reasonable good, meaning projects are financed adequately.

4.6.4 Design changes by client during construction

This factor received a highest rating on good of 53.63% with excellent on 1.45% and reasonable on 21.74%. These results indicated that the Client did not impose numerous variations on projects. The second-high rating was 21.74% on reasonable. Very bad and bad received 4.35% and 15.95% respectively. No negative influence identified to have been imposed by the client on project.

4.6.5 Experience and skills capacity of the client

On this aspect, a highest rating of 49.28% on good was received with 4.35% on excellent. There seem to be a fairly skilled and experience capabilities from the Client to work on projects. Reasonable rating received 14.49%, then bad on 23.19%
with very bad on 4.35%. These rating outcomes indicated that Client should consider the enhancement of skills as just adequate skilled personnel may disadvantage the contribution and support to the project in terms of lack of know-how.

4.6.6 Project duration set by client

The highest rating received on this factor is 65.22% with excellent on 1.45%. These were the best rating received indicating that the Client does not influence or impose on the construction period. Seemingly contract period were projected based on the amount of work to executed, not based on the time frames imposed by the Client. On reasonable a rating of 13.04% was received, then 10.14% on bad and very bad on 5.8%. The negative rating which are bad and very bad received insignificant ratings, meaning the influence by the client is far less on project duration.

Client seem to be handling projects reasonable well in relation to the factors within which control resides on. There is one factor that the client is handling poorly, the speed of decision making by client. This factor has an important effect on time and cost performance of the contractor. The client should improve immensely on this factors to accelerate construction.

4.7 CONTRACTOR RELATED FACTORS

Contributing to the performance of the contractor are the factors that the contractor is responsible for during construction. Below on figure 4.7 are the factors that depends on contractors and effects the performance.
4.7.1 Site management

Site management received a highest rating of 44.93% on good followed by bad on 27.54%, then reasonable 13.04%, then excellent on 7.25% with least rated very bad on 2.9%. Considerably 44.93% is below average, adding the excellent rating amounts to 52.18% which is just above average. This means that for site management contractors are not so organised. The positive side to this outcome was that at least the highest rating was a positive rating.

4.7.2 Financing by contractors

Financing by contractors received a highest rating on good of 44.3% which is also below average. This rating indicated that contractors are partially financial stable in terms of cash injection in same project. The second highest rating was bad at 30.43%, meaning in some projects contractors battle to finance project. Reasonable rating was at 13.04% a poor rating indicating that project financing by contractor is indeed bad.
4.7.3 Experience of other contractors

This rating refers to the sub-contractors which are contributors to the contraction process. The highest rating was on good with 68.12% suggesting that sub-contractors that were recruited on projects were experienced. The second rating was on 8.7% of reasonable, then 5.8% on excellent. All these rating contribute on the positive rating. Very bad and bad received ratings of 0% and 13.04% respectively. This outcome clearly indicated that main contractors had experience sub-contractor on most of the projects. Ultimately, if a sub-contractor is experienced production would contribute to positive performance of the main contractor.

4.7.4 Construction methods

Construction methods received a highest rating on good of 58.12% with excellent rating of 5.8%. Contractors were said to be correctly selecting the suitable method of construction which can assist in the acceleration of the project. An incorrect construction method leads to various challenges on site which contributes to delays. On reasonable a rating of 8.7% was received which is an average by nature and falls on positive rating. Only 13% of bad with 0% on very bad rating outcome. These are insignificant figures; the dominant rating is good. Construction methods which contractors adopt or employ on site were found to be success factor.

4.7.5 Availability of labourers on site

This aspect only the contractor is solely responsible as resource allocation depends on the work brake down components and the program. A rating of 69.57% on good was received with excellent on 4.35% and reasonable on 7.25%. These results indicated that contractors were identifying suitable personnel on labourers to support the construction process. On bad and very bad ratings of 10.14% and 4.35% were received.

4.7.6 Availability of equipment
This aspect is a responsibility of the contractor as a resource allocation mechanism. An outstanding rating of 71.01% on good was received with 5.8% on excellent and reasonable on 7.25%. Contractors seemed to have been allocating and availing necessary equipment on site during construction that assisted in the program acceleration and overall progress. This aspect is important as if is not executed well may lead to project being delayed and derailed from the program. On very bad and bad a rating of 2.9% and 8.7% was received. These were minor rating were a substantial amount of rating was on good. The indication which was clearly outlined by these results is that contractors were managing this factor well.

Constructors turned to be working towards achievement of a good performance in all aspects of the projects. There seem to be a good resource allocation during construction by contractors. These factors are major construction production and success of the project. An improvement is needed on site management and project finance by contractors though.

4.8 PROFESSIONAL TEAM RELATED FACTORS

On this study, there is only one factor that is the responsibility of the professional team, the experience of consultants. This factor is the most important for professional team’s impact on the projects for all other elements depend on this one. Professional team are path-finders on projects for all stakeholders are shown below on Figure 4.9.

Figure 0:9 Professional teams related factors

<table>
<thead>
<tr>
<th>CONSULTANTS RELATED FACTORS</th>
<th>Experience of consultants</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>VERY BAD</td>
</tr>
<tr>
<td>2</td>
<td>BAD</td>
</tr>
<tr>
<td>3</td>
<td>REASONABLE</td>
</tr>
<tr>
<td>4</td>
<td>GOOD</td>
</tr>
<tr>
<td>5</td>
<td>EXCELLENT</td>
</tr>
</tbody>
</table>
4.8.1 Experience of consultants

Experience of consultants was rated at 69.57% on good and it is the highest rating, followed by excellent, reasonable and bad on 8.7% simultaneously. On very bad a 0% rating was received as an outcome. Constants are said to be very experienced according to this outcome. Contributing to this outcome, consultants are referred to as professional teams. That description on its own depicts a prestigious approach or level of operation consultants adopt. This outcome indicates that in project consultants are highly experience to undertake the work at their disposal. Know-how is an advantage in construction industry in general. Consultants serve as overseas in project, if they lack in experience project may be subjected to various challenges leading to delays.

4.9 COMBINED CONTRACTOR, CLIENT AND PROFESSIONAL TEAM RELATED FACTORS

A success of the project is a determinant of a support and contribution of stakeholder. There are factors therefore that all major stakeholders are responsible of and with an equal role to play. Figure 4.9 shows a collaboration effect of major stakeholder in support of the project and contributing to contractor performance.

Figure 0:10 Combined contractor, client and professional team related factors
4.9.1 Coordination among parties

This factor all three stakeholders as tabulated above on table 4.4 are contributing. Each party has a reasonable contribution on how to collaborate within the construction stakeholders. In an event where the parties are not collaborating among each other progress can be affected. The highest rating of 37.68% on good was received, followed by 33.33% on bad. Reasonable rating is on 17.39%, then 4.35% on excellent. There were indications of non-coordination amongst parties on project. All ratings were way below average, meaning coordination among parties is poor.

4.9.2 Preparation of program and monitoring

For preparation of program and monitoring a highest rating of 60.87% on good was received from the responses. This was a positive response which suggested that construction programs are prepared well by contractors and monitoring by professional team was done realistically. Good rating was the outstanding component of all ratings with excellent on 2.9% both amounting to 64%. Second rating was 17.39% on reasonable also contributing to the positive outcome. Very bad and bad 2.9% and 11.59% respectively, both the amounted to 14%. This outcome turnout to be insignificant in terms of impact. The prevailing situation which is dominating was identifies as being good.
4.9.3 Availability of staff to manage projects

On this aspect, all three major stakeholders seemed to be an outstanding outcome as a rating of 73.91% on good was received with 1.43% on excellent. This was an outstanding outcome indicating that Contractors, Professional teams and the Client were allocating project personnel to manage projects. On reasonable a rating of 8.70% was received also can be attributed to positive rating on this aspect. Very bad and bad received rating of 2.90% and 7.25% respectively. The prevailing rating was the positive one surpassing all the others especially the negatives ratings.

4.10 OVERALL FACTORS AFFECTING PERFORMANCE RATINGS

They were seventeen factors as appearing on figure 4.6 below, selected for this study that may impact of the performance. Below on figure 4.5, all ratings and various factor that affect performance during construction are depicted. This is a summarized vision of the outcome on how the performance of the contractor may be affected by these factors. According to the outcome, most of the factor seem to be handled well to such an extent that they may have little or no impact on the performance of contactors.

The illustration on figure 4.5 demonstrated the levels of rating for all seventeen factors affecting contractors. On x-axes coding labelling from A1.1 to A1.17 represents factors as they appear on the questionnaire.

4.10.1 Rating classifications on factors

The overall rating as classified according to a state of assessment is portrayed below on figure 4.6. The assessment criteria made an allowance of a rating scale between excellent and very bad on a five category measurement. The worst rating is very bad followed by bad, on average it was reasonable. Excellent is the best rating followed by good.
All seventeen factors received a highest rating on good excluding one which is the speed of decision making by the Client. On good the lowest rating percentage received was on speed of decision making by the Client at 24.64%.

The highest rating being on availability of equipment during construction at 71.01%.

In the Management of these factors excellently, rating outcomes were ranging between 1.45% to just below 9%. At this rating the assessment outcome indicated that these factors were managed accurately, impacting positively the performance. Mostly these factors affect good performance of constructor during construction.

Reasonable was rated between 21.74% and 7.25%. The rating in this aspect was almost fairly distributed. There was no outstanding rating, the values were closely related in terms of amount. This was an indication of a fairly impact on performance between good performance and bad performance.

On bad rating, a maximum rating of 33.33% was received with a minimum of 1.25%. Factors that were rated above 20% included, Site management by the contractor, Financing by the contractor, coordination among parties, Speed decision making by the contractor, Experience and skill capacity of the contractor. The worse rated on 33.33% is the Coordination among parties.
Very bad received highest rating of 21.74% with a lowest rating of 0%. All other factors were minimal rated at a level of 6% and below. Speed decision by the Client seemed be the factor that affect contractor performance negatively, as rated on 21.74%.

4.11 OPEN-ENDED QUESTION OUTCOMES

Most of respondents abstained from answering open-ended questions. The few which were received are listed below and were written as they appear on the questionnaires. No alteration of sentence was made, even on instances where the researcher could not understand what the respondent meant. Also a provision of the project list had been done by capturing from questionnaires as declared by respondents.

4.11.1. Other important factors

Respondents were requested to list other factors that they wanted to bring to the researcher’s attention. These factors are classified according to the relevant stakeholder and were as follows:

Community related factors

1) Project community by-in
2) Project by-in by the community
3) Resistance of beneficiaries
4) Community unrest
5) Critical to the success of this project was the communication between the Engineers Representative on site with the local community without this good relationship this project would not have been the success it was.
6) Lack of community structures who we could deal with regards to movement to informal structure.
7) Availability of Skilled labourers among community members.
8) Lack of community structures who we could deal with regards to movement to informal structure.

**Governance factors (client)**

1) Project litigation.
2) National strikes by supplies
3) Inter-governmental relation to be improved
4) Poor relations within the municipality and Provincial Department of Human Settlements
5) Relationship between BCMM and internal sections and housing unit including Provincial Department of Human Settlement.
6) Uplifting the performance of the contractor on site.
7) As this site was located basically on top of an old refuse dump the soil conditions the contractor was required to deal with were often really bad, this affected performance.
8) This was a very difficult site due to its steep topography in places and there was an existing community already living there in shacks, this resulted in the project having to be phased to allow for the relocation of the community at times.
9) Lack of commination and structure in BCMM internal structure, leading to delays in resolving community and site issue.
10) There is need for improvement regarding contract administration on the part of the client.
11) What are Decision making provisions of the Contracts Manager in Government contracts especial in Municipalities where there is Accounting Officer powers as stipulated in Municipal Finance Management Act, Senior Managers reporting to the Accounting Officer with delegated powers including the Bid Adjudication Committee Members.
12) General plans not well co-ordinated from initiation of the project which is always the case with the client.
13) Demand of material suppliers in the province
14) None, as this project was completed in-advance and under the budget, but this type of project is the exception not the rule.
15) Design changes, quality of work.
16) Project pre – planning.
Contractor related factors

1) Skills transfers.
2) Time Management
3) Cost Management

Performance aspects

1) Contract Management.
2) Legal process through poor contract management
3) Beneficiary satisfaction
4) Quality control
5) Prioritisation of housing development planning
6) Attention of the research electrifying of the completed units as soon the beneficiary gets in.
7) The contractor on this project consisted of two companies, one was responsible for the civil works and the other for the construction of the RDP houses, this resulted in the slower of the two contractors (Housing) delaying the project even though the other contractor (Civil) was on time.
8) Productivity is linked to having complete access to all works so that programming of activities is construct, when access is partial to the works it is difficult to be productive.
9) There are problems with non-beneficiaries as they are not willing to move their shacks to clear the way for as the contractor wants to work on the space they occupy, as a result this has generated delays amounting to millions of Rands.
10) Quality Assurance against cost and time limitations.
11) Procurement systems
12) Health and Safety
13) Quality Management systems
4.12 CONCLUSION

In this chapter findings or outcomes of the study were found to be related to the literature as discussed in chapter 2 of this study. The instrument was also found to be accurate for this, as answers received where directly related to the study. Open-ended questions were answered in various responses, but some of the answers were similar. This can mean that, respondents somewhat, share the same sentiments. Also other factors that were not part of the study have been indicated by respondents as having an effect on contractor performance during construction. Respondents participated in this study from 39 Buffalo City Projects undertaken.
CHAPTER FIVE
INTERPRETATION OF RESULTS, RECOMMENDATIONS AND CONCLUSION

5.1 INTRODUCTION

In this chapter is an interpretation of the finding and results, recommendations and conclusion are established in relation to the data analysed done on chapter 4. A summary of the research is outlined as well as the limitations that have been identified during data analysis. Literature where necessary will be interrelated with the study outcomes.

5.2 SUMMARY OF RESEARCH RESULTS

This study observed the performance of contractor in different aspects during construction and furthermore factors affecting contractor performance. Literature review focused on the argument on how contractor performance can be affected if measured through seven key performance indicators that were selected for this study.

The outcome on the assessment of contractor performance based on the evaluation of KPI’s and factors affecting performance, contractors in Buffalo City Metropolitan for infrastructure and housing project was a good performance level. Similarly, to factors that affects contractor performance during construction was a good effect.

The objectives of this study were:

a) To determine the performance of contractor’s based on their KPI’s
b) To determine the factors influencing the performance of contractors
c) To determine the relationship between factors influencing performance and the actual performance.

The research approach used in this study was a quantitative with a descriptive statistical analysis. The study was undertaken within Buffalo City Metro Municipality
on infrastructure and housing projects. The purpose of the study was to assess the performance of contractor contributing to grant funding expenditure.

Research was conducted with 69 responses using a through a method of a questionnaire. Results were analysed and outlined in chapter 4 of this study through a use of charts and frequency tables.

5.3 AN EXTENSIVE LITERATURE REVIEW ON PERFORMANCE ASSESSMENT OF CONTRACTORS

On chapter 2 of this study, a thorough literature review has been conducted extensively for and the following points were highlighted:

a) The enhancement of the researcher’s knowledge on significant aspects of this study.
b) The attainment of basic concepts in order for the aim and objectives of this study to be fulfilled.
c) The identification and understand of association amongst concepts
d) The obtainment of a solid foundation to support this study.
e) An enabling environment in analysing the current literature and providing reasoning on this study shall fit to the current body of knowledge.
f) The provision of overall understanding which has contributed on research outcomes discussion, detemination of recommendation and conclusions.

5.4 THE PERFORMANCE OF CONTRACTOR’S BASED ON THEIR KPI’S

5.4.1 Main finding

Study findings indicated that out of seven key performance indicators, contractors are performing well on five and on rest of the two contractors are fairly performing below average to be precise. It outcome indicated the following raking for each indicator;
a) Client Satisfaction at 58%, was ranked as the first indicator that contractors were observed to be performing good.

b) Productivity 57% was ranked as the second indicator that contractors were observed to be performing good.

c) Rework 51% was ranked as the third indicator that contractors were observed to be performing good.

d) Defects 49% was ranked as the fourth indicator that contractors were observed to be performing good.

e) Scope Variation 48% was ranked as the fifth indicator that contractors were observed to be performing good.

f) Construction Cost 39% was ranked as the sixth indicator that contractors were observed to be performing good.

g) Time 36% was ranked as the seventh and the last indicator that contractors were observed to be performing good.

In overall contractors are performing between reasonable and good in all aspects based on the selected key performance indicators. The highest rated indicator was client satisfaction on 58% and the worst rated was rework and defects on 11.6% simultaneously.

It is there evident that contractors are performing well on an overall average of 48% for all key performance indicators combined. Performance need to improve for all KPI’s to be above average.

5.4.2 Recommendations

Mechanism must be put in-place to improve the overall performance of contractors in these aspects. Contributary factors to poor performance must be identified and be managed well so as to improve performance. Construction time and cost were the worst rated aspects of construction, and according to the literature these two impact on each other most of the time during construction. There are time related costs on construction, they may be contributing to this effect. Time management is an important concept that must be employed on projects.
5.5 THE FACTORS INFLUENCING THE PERFORMANCE OF CONTRACTORS

5.5.1 Main finding

There were seventeen selected factors for this study to evaluation the effect on the performance of contractors. Majority of the factors were raked to be positively affecting the performance of contractors. Factors were classified according to parties responsible between Client, professional Team and Contractor, and some factors where a shared responsibility among these parties. There were nine factors that were Client’s responsibility, where in two the Client share the responsibility with other parties. Professional teams were responsible for five factors, where in three were a shared responsibility with other parties. Contractors were responsible for nine factors, and three were a shared responsibility amongst other parties.

Where contractor performed fairly good, on Time and Cost is was identified that three factors played a role in the poor performance as they seemed to have been poorly managed. These are the factors affecting poor performance simultaneously:

a) Site management
b) Coordination among parties
c) Speed of decision making by Client

The rest of the factors seem to be have been handled well resulting to a positive effect of contractor performance, as the performance turn out to be good.

5.5.2 Recommendations

The client must improve on speed of decision making for an improved contractor performance outcome. Contractors have not time to wait during construction, time is an expense based on inflation and other economic factors as well as the climate. Contractors must improve on site management for a proper work facilitation in order to attain a meaningful progress on construction activities.
5.6 THE RELATIONSHIP BETWEEN FACTORS INFLUENCING PERFORMANCE AND THE ACTUAL PERFORMANCE

5.6.1 Main finding

Out of the seventeen factors, eleven were found to be affecting the projects positively in terms of the performance of the contractor. The rest of the six factor with rating below the average can be classified as being affecting the project negatively if are not managed well as per the outcome of the study. This, then lead to contractor having to score less on the following two KPI’s that are related with these factor. To be precise, the following factors according to the literature affect performance of contractors on, time and cost.

**Time performance** was affected by these factors:

a) Site management  
b) Coordination among parties  
c) Speed of decision making by Client

**Construction cost** performance was affected by these factors:

a) Coordination among parties  
b) Financing by Client  
c) Speed of decision making by Client

Evidently, even this study time and cost were found have been affected negatively by these factors as detailed above. The rest of the factor seem to have affected the project positively, hence the good performance outcome of contractors.

5.6.2 Recommendations

All factors that relates to construction time and cost must managed well so as to improve these aspects of performance during construction. A collective participation of stakeholders is required to optimally manage these factors.
5.7 OVERALL INTEGRATED RECOMMENDATIONS REGARDING THE AIM OF THIS STUDY

Study outcome reviled that contractors are performing on a good rate. Nevertheless, there an improvement is necessary as some of the factors have impacted negatively on performance resulting to average rating outcome. The following are recommendation that can assist in overall performance management:

a) BCMM should employ mechanisms that will assist performance improvement of contractors. The best would be to manage poor rated factors that the municipality is responsible for such as; Speed of decision making by Client. This factor was poorly rated.

b) Performance management of contractors should be done timeously in relation to indicators and their factors that shall be measured against as indicated.

5.8 RECOMMENDATIONS FOR FUTURE STUDIES

Further research is recommended based on the following:

a) There are other very important factors that were not included.
b) There can be other Key Performance Indicator’s which were not included in this study.
c) Community involvement is a factor that was not used in this study but was clear from open ended questions.
d) Reasons for long decision making by the client on projects during construction.

5.9 CONCLUSION

This study focused on the assessment of contractor performance during construction based on selected key performance indicators. There were also factors selected for this study that affects performance of contractors. An evaluation of these factor and KIP’s was done and the outcome was that contractors are performing well.
In conclusion, contractors are generally performing well on infrastructure and housing project in Buffalo City Metro Municipality. There is an improvement necessary though on all aspects for a better acceleration of projects and ultimately service delivery rendering rate.
REFERENCES


ADDENDUM A

Questionnaire
Questionnaire for contractors

COVER LETTER FOR SURVEY

Dear Respondent

My name is ..................

I am studying towards my MBA (Masters in Business Administration) degree at the Nelson Mandela Metropolitan University Business School. I am conducting research on Contractor Performance on Human Settlements Projects. I believe that my study will make an important contribution to the improvement of contractor performance management.

You are part of our selected sample of respondents whose views we seek on the above-mentioned matter. We would therefore appreciate it if you could answer a few questions. It should not take more than fifteen minutes of your time and we want to thank you in advance for your co-operation.

There are no correct or incorrect answers. Please answer the questions as accurately as possible. For each statement, tick the number which best describes your experience or perception. For example, if you strongly agree with the statement, tick the number 5. If you strongly disagree with the statement, tick the number 1. **Tick only one answer for each statement and answer all questions please.** Please note also that your participation in this study is entirely voluntary and that you have the right to withdraw from the study at any stage. All information will be kept confidential and aggregated results only will be used in the report.

Thank you very much.

Thomakazi Ngqinamabi

Cell 072 7835 596
To verify the authenticity of the study, please contact Mr Dorrington Giyose (Research Director: NMMU) at telephone number 0415044906

SECTION A

Please mark the appropriate box with an “X”

Are you a?

Your years of experience in construction projects

What was the name of the last project you did for Buffalo City Metro Municipality?

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Please describe how you experienced the following conditions in the last project that you did for Buffalo City Metro Municipality

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<tr>
<th>Condition</th>
<th>Very bad</th>
<th>Bad</th>
<th>Reasonable</th>
<th>Good</th>
<th>Excellent</th>
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<tr>
<td>Site management</td>
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<td>Financing by contractors</td>
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<td>Coordination among parties</td>
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<td>Preparation of program and monitoring</td>
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<td>Experience of other contractors</td>
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<td>Construction methods</td>
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<td>Experience of consultants</td>
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<td>Soil conditions</td>
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<td>Infrastructure management</td>
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<td>Condition</td>
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<td>Speed of decision making by Client</td>
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<td>Financing by Client</td>
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<td>Design changes by Client during construction</td>
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<td>Experience and skills capacity of the Client</td>
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<td>Project duration set by Client</td>
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<td>Availability of labourers on site</td>
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<td>Availability of staff to manage projects</td>
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<td>Availability of equipment</td>
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List other conditions that you think has to be brought to the attention of the researcher

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Please indicate your opinion on your own performance in respect of the following dimensions for the last project that you did for Buffalo City Metro Municipality.

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<tr>
<th>Dimension</th>
<th>Very bad</th>
<th>Bad</th>
<th>Reasonable</th>
<th>Good</th>
<th>Excellent</th>
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<tr>
<td>Client satisfaction</td>
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<td>Time</td>
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<td>Construction cost</td>
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<td>Productivity</td>
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<td>Scope variation</td>
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<td>Rework</td>
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<tr>
<td>Defects</td>
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List other performance aspects that you think has to be brought to the attention of the researcher

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ADDENDUM B

NMU Declaration statement
DECLARATION OF OWN WORK

DECLARATION

I, Thomakazi Thobeka Ngqinambi, student number 213459590, hereby declare that the treatise for Student qualification to be awarded is my own work and that it has not previously been submitted for assessment or completion of any postgraduate qualification to another University or for another qualification.

...........................(Signature)
Student Name here

Official use:

In accordance with Rule G5.6.3,

5.6.3 A treatise/dissertation/thesis must be accompanied by a written declaration on the part of the candidate to the effect that it is his/her own work and that it has not previously been submitted for assessment to another University or for another qualification. However, material from publications by the candidate may be embodied in a treatise/dissertation/thesis.
ADDENDUM C

Participating projects
The following projects participated in this study:

1) Airport Phase 2A housing project
2) Alphandaile housing project
3) Amalinda Simanyene housing project
4) Braelyn ext 10 housing project
5) Bulembu rural housing project
6) Cambridge Phase 2 housing project
7) Chris Hani housing project
8) Devana Rural housing project
9) Dimbaza housing project
10) Dongwe Rectification housing project
11) Ducats housing project
12) DVRI Pilot housing project
13) Egoli rectification housing project
14) Fynbos Phase 1, Fynbos Phase 2 and Ndancama housing project
15) Ilitha wooden housing project
16) King Williams Town public transport facilities upgrading of market square taxi terminus and taxi city
17) Kwa Tshatshu pedestrian bridge
18) Lilivail housing project
19) Maclean town housing project
20) Mdantsane Cluster 1 Infill Areas: 1459 Units housing project
21) Mdantsane Cluster 2 housing project
22) Mdantsane Zone 18cc housing project
23) Mzamohle housing project
24) Needs Camp housing project
25) Pakamisa housing project
26) Park Ridge Housing project
27) Potsdam Unit P Construction of 900 housing project.
28) Reeston Phase 1 and Phase 2 Stage 1D housing project
29) Reeston Phase Stage 3 housing project
30) Second Creek housing project
31) Strom damage rebuilding housing project
32) Sunny South Rural housing Project
33) Sweet waters housing project
34) Thembelihle- Manyano housing project
35) Tshabho Phase 1 and Phase 2 rural housing project
36) Tsholomnqa housing project
37) Tyutyu Phase 1 housing project
38) Westbank restitution housing project
39) Z Soga housing project
ADDENDUM D

TURN-IT-IN REPORT
213459590_TT Ngqinambi

ORIGINALITY REPORT

6% SIMILARITY INDEX
5% INTERNET SOURCES
2% PUBLICATIONS
3% STUDENT PAPERS

MATCH ALL SOURCES (ONLY SELECTED SOURCE PRINTED)

< 1%
★ misto.e-informatyka.pl
Internet Source

Exclude quotes
Exclude bibliography
Exclude matches < 8 words