UNIVERSITY OF THE WITWATERSRAND

COMPARING FACILITY MANAGEMENT STRATEGIES IN PUBLIC SECONDARY SCHOOLS IN GAUTENG: A COMPARATIVE CASE STUDY OF FORMER MODEL C SCHOOLS AND PREVIOUSLY DISADVANTAGED SCHOOLS IN SOUTH AFRICA.

A dissertation submitted `to the Faculty of Engineering and the Built Environment, University of the Witwatersrand, in fulfilment of the requirements for the degree of Master of Science in Building.

in

Project Management

by

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September, 2014.

Declaration

I declare that this research report is my own work. It is being submitted for the degree of Master of Science in Building (Project Management) to the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination to any other university.

(Signature of Candidate)

----------Day of----------2014.

Dedication

I dedicate this to the Almighty God and to my 94 year old “gogo” Dinah Nkuta for all the sacrifices and the financial support during my first year, she has made it possible for me to receive a quality education and even though her age will not let her to see my work, her sacrificial nature and discipline are lessons that I will always carry with me throughout my life.

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Acknowledgements

I would first like to thank my supervisor Dr Stephen Allen, for being a constant source of support since he became my supervisor and for guiding this research in the direction that I never thought I would achieve.

This research would have not been possible without all the participants of this study, to all the school principals who gave of their time and their staff. A special thank you to Mr Trevor du Plessis from the Department of Basic Education for assisting me to gain access to all the relevant people within the department

I would like to thank my parents for the love and understanding over the years and I would also like to thank my sisters Sanelisiwe, Jabulile, and Ziyanda Nkuta. I would like to also show gratitude to my maternal grandparents for the support and encouragement.

Lastly to my fiancé, Justice Nkuna thanks for the support and constant flow of ideas.

Abbreviations

CIDB	Construction Industry Development Board
CSIR	Council for Scientific and Industrial Research
DBE	Department of Basic Education
DET	Department of Education and Training
EMIS	Education Management Information System
FM	Facilities Management
HOA	House of Assembly
HOR	House of Representatives
PED	Provincial Education Department
SAICE	South African Institute of Civil Engineering
SASA	South African Schools Act
SGB	School Governing Body
SIPIS	School Infrastructure Performance Indicator System
UNESCO	United Nations Educational Scientific and Cultural Organization

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Abstract

South Africa is a country that has been plagued by many social ills of the past due to its history that segregated the nation in terms of race. The impacts of this have been seen in many sectors within the country and one of such areas is education. School systems in many countries especially those in extreme poverty areas experience a substantial amount of building decay as compared to schools with excellent building conditions normally found in suburban areas. There is value in maintaining these structures. "The racially discriminatory system of education spending under the apartheid system, has bequeathed to this country and the Gauteng province in particular a public school system in which some schools are much better resourced than most other schools in the system." (Judge Mbha, 2011, per comm.)

The review of literature showed that there are variances within the public school system in South Africa especially those relating to the building conditions and the impact that they could ultimately have on the learner's outcomes. Hence in order to offer solutions to one of South Africa's most important commodity "education", this research aims to examine the current policies and compare facilities management maintenance methods utilized in former "Model C" and former Department of Education (disadvantaged) public schools, and to identify and recommend the methods utilized in schools with a higher standard of maintenance and physical facilities management (FM) policies.

Using the case study method of qualitative research, data were collected through semi-structured questionnaires complemented with interviews. The principals and custodians of school facilities conveyed various levels of understanding of school facilities management policies and implemented them similarly in certain aspects and differently in areas of management. These are visible in the physical fabric condition of the school. Former Model C schools facilities are still managed more efficiently. The recommendations are that the DBE finalizes the maintenance document that will guide schools on how to manage their facilities efficiently. Benchmarking and bestpractice of FM methods should be used in schools, and lastly equipping the general workers of schools with various building trades allows school facilities to be managed more effectively.

Keywords: Facilities Management, Facilities Management Strategies, Former Model C, Previously Disadvantaged, South African Ordinary Public Schools.

Chapter 1: Introduction

1 Introduction

Gallie *et.al* (1997) argue that in the absence of rapid developments in the management area, South Africa's former black schools have remained disadvantaged, while schools that were previously for whites have continued to grow and thrive. Shirley (2012) points out that like many aspects of South African history, apartheid has had its effect on the school systems in South Africa. As a result the different race groups were kept apart from one another and received school education on a level that the state felt was appropriate for them. This brought about unequal levels of education amongst the different race groups. White South Africans were at the most advantaged followed by Indians, Coloured and lastly African students. More funds were channelled into white schools and very little was given to other race groups, resulting in a lower standard of education and facilities being very poor and overcrowded at some other disadvantaged groups. This is eminent in a conclusion by Spaull (2011) that there are still two school sub systems in South Africa, one which is wealthy, functional and able to educate students and the other which is poor and dysfunctional and falls short of arming learners with the necessary numeracy and literacy skills that should be acquired at a primary school level.

Lavy (2008) contends that many organizations fail to realize the importance of facilities management towards their "business performance or success", but business success should not only be determined by profit margins and revenue but rather by other aspects of the building portfolio and environment maintenance. This would include daily maintenance, energy consumption, carrying out condition assessments and benchmarking studies, aligning with policies and assisting with the implementation of the organizations strategic and tactical planning. The FM function within any organisation should come along with a strategy and as defined by the Strategic Facilities Management Community, strategic facilities management is a strategic discipline that provides safe, healthy, reliable and productive work environments which enable the core business to achieve its objectives, it is about maximizing value to the business. In the Department of Basic Education (2012) Guidelines Relating to Planning for Public School Infrastructure the Director General of Basic Education points out that "The quality of school buildings is critically important in the drive for improving education. Good quality facilities provide teachers and students with supportive environments that are responsive to their changing needs and could make a real difference to learning and teaching." A study that was conducted by the United States of America Department of Education in (2000) highlighted arguments by various authors that the decay of infrastructural facilities of schools impacts negatively on

the learning, health, safety and morale of students. As a result, good quality facilities play an important role in achieving learning and teaching outcomes. Unfortunately, many school facilities in South Africa are not well maintained, as evident in a report on Infrastructure released by the South African Institute of Civil Engineers (SAICE) in (2011). The report found that in general maintenance of education infrastructure in South Africa has been limited resulting in conditions of deteriorating facilities across all provinces and the fact that there are also disparities in the state infrastructure with urban and ex "Model C" schools being generally better maintained than rural schools. Hence the problem statement explored in the this research emanates from the concerns highlighted by numerous authors, and is the argument of the researcher that an element that could assist in overcoming some of these challenges is the effective management of the physical facilities of the previously disadvantaged schools through the emulation of effective "former Model C" school facilities management strategies.

1.1 Statement of the problem

Roodt (2011) highlights that the Department of Basic Education (DBE) needs to further examine what is being done right in good former "Model C" schools and other well-functioning schools and emulate this in schools which are performing poorly. Taylor (2006a) highlights that "former Model C schools are generally well resourced and are functioning and performing well within the present model of state-aided school governance, whereas most previously disadvantaged schools are dysfunctional".

Xaba (2012) states that while not particularly explored in South Africa the significance of facilities maintenance to school functionality is recognized worldwide to the extent that education departments have dedicated organisational structures or units responsible for school facilities management and maintenance. A study that was done by Lanham (1998) where results from an academic proficiency test in a small, rural high school in Virginia (USA) indicated a positive relationship between building condition and student achievement. School buildings with better structural and aesthetic qualities scored higher. Combined results on test scores were 5% higher for students in better designed schools. From various tests carried out by Kamper (2008) this theory is emphasized by the results of a study carried out in South Africa which show that poor schools were least able to systematically overcome inherited socio economic disadvantage. Kamper (2008) accentuates this argument by citing (Shanklin *et al*. 2003:357; Acker-Hocevar & Touchton, 2002c:) that the school environment in townships and rural areas is typically characterised by "unkempt school premises, rundown buildings, damaged and inadequate furniture, no waste collection facilities, substandard toilet facilities and physical danger points (such as those due to faulty electrical wiring)". Kampar (2008) further points out that it is not surprising that "struggling" and "sinking" schools are normally located in high poverty areas, because leadership in these types of schools has proven to be challenging and thus not easy to overcome the socio economic drivers surrounding them. Unfortunately maintenance of public school facilities is normally an area

that is neglected in many schools especially in previously disadvantaged schools. Lanham (1998) concludes by advising school planners and finance officers to take the age of the school buildings across the state into account when making long range plans for overall expenditure and facility improvement as keeping the school facilities clean and well maintained can have a positive impact on learner achievement. The argument presented above further highlights the discrepancies in the school system and the impact they generally have on learners.

1.2 Purpose of the Study

This research sought to examine the condition and maintenance strategies of the physical facilities of former Model C schools and township/rural schools in South Africa and ascertain which facilities management strategies enhances the preservation of these schools' infrastructural facilities. Hence the aim is to establish effective FM strategies for physical ordinary secondary public school facilities maintenance by comparing deemed effective strategies in former Model C versus deemed ineffective strategies in previously disadvantaged South African ordinary public secondary schools.

1.3 Research Objectives

- To determine the Department of Basic Education guidelines to maintaining and managing schools facilities.
- To establish the Facilities Management (FM) strategies or guidelines which allow schools to operate efficiently.
- To establish whether there is replicable FM strategies that can be applied to dysfunctional public schools from other public school models in South Africa.

1.4 Research Questions

The huge inconsistencies in delivery in South Africa present a challenge to planning and managing school infrastructure and raise a number of questions.

Main research question:

Is there a difference between facilities management strategies in former Model C schools and previously disadvantaged schools?

Research Question 1:

Is there a poor preservation of school infrastructure in township schools?

Research Question 2:

What facilities management strategies are in place in public secondary schools?

Research Question 3:

What facilities management challenges are former Model C and township/rural schools normally faced with?

Research Question 4:

How are the policy guidelines for infrastructural management in schools in former Model C and township schools?

Research Question 5:

What impact did the skewed resource allocation in South African schools have on the management of the physical facilities of schools?

Research Question 6:

How can infrastructural facilities management processes of previously disadvantaged schools be improved?

1.5 Justification for the research

1.5.1 Importance of Good Quality School Facilities

The state of some South African public schools leaves much to be desired, it is evident in the observations from the South African Institute of Civil Engineering (SAICE) Report on Infrastructure in 2011, which graded the state of engineering infrastructure in South Africa. The SAICE report graded overall educational facilities as a "D+". This score means that school infrastructure in South Africa is not coping with the demand that it is designed for and is

poorly maintained. The report concludes by stating that it is likely that the public will be subjected to severe inconvenience and even danger without prompt attention of school facilities. According to a report by the United Nations Educational Scientific and Cultural Organization (UNESCO) (2013) “The quality of a school’s environment and its facilities has a strong influence on students’ learning”. Othman & Muijs (2013) have generally found physical resources to be significant in improving academic achievement. Besides regular use in organizing and managing a school’s activities, it is important for schools to keep records of a school’s physical facilities and material resources.

The impact of poorly maintained school facilities is discussed by Lunenburg (2010) who reasons that aging school buildings often create barriers, such as poor air quality, unconducive thermal comfort and poor acoustical quality and compromised quality to natural lighting that can impede effective teaching and learning. Cash & Twiford (2010) also emphasizes that many authors from the USA have been joined by international researchers in confirming the link between the building condition and student achievement. Earthman (2002) confirms that poorly maintained buildings impact student achievement through a validation study carried by Cash (1993). The study was conducted on high schools in North Dakota and found that there was a difference of 5 percentile ranking points on total achievement scores for students in substandard buildings and learners in standard buildings and there were 7 to 9 percentile differences in reading, vocabulary and spelling sub-tests. There are consequences for schools with inadequate facilities. The learning process is impacted and both the learner and teacher may struggle with issues such as noise, poor indoor air quality, poor lighting and even physical security concerns as it is emphasized by Bello & Loftness (2010).

Coleman *et al.* (1966:325) who is cited by Christie *et al.* (2007) differs from the notion that the school facilities bring a positive influence on the child’s performance. The argument stated asserts that the inequalities imposed on children by their background i.e. (homes, neighbourhoods and peer environment) are normally the inequalities that follow them in life and that schools have a minimal bearing on a learners achievement.

“Schools bring little influence to bear on a child’s achievement that is independent of his [or her] background and general social context….the inequalities imposed on children by their home, neighbourhood and peer environment are carried along to become the inequalities with which they confront adult life at the end of school” Christie & Butler et al .

Cooper (1985), points out that the clichéd views that good schools are not made by their buildings, but instead by what is taught inside the schools is not entirely true Cooper (1985) opposes this view “that the best of buildings will never by itself make a good school”, and that children cannot give their best unless we [educational administrators] make it possible for them to do their work in reasonably comfortable and commodious surroundings.” Cooper (1985).

Christie *et al.* (2007) notes that different work on schools and social inequality that addresses various theories commonly all reach the same conclusion that school buildings play a key role in the developing of social patterns including patterns of inequality. Hence the importance and need for this study.

This research will bring into light the challenges faced by public schools with regards to the maintenance of the physical facilities of schools, especially those schools that were highly disadvantaged in terms of resources during the apartheid regime. Christie *et al.* (2007)) argues that "Most schools are not resourced with laboratories or sports fields, and while they have running water and electricity, most have pit latrines and no internet facilities for learners. At one edge of this main stream are schools in communities so poor that fees and associated costs of schooling are simply not affordable. At the other edge are the majority of former white schools, with a legacy of physical resources."

Saunders (2000) points out that in most studies conducted for developed countries little emphasis is placed on the state of material and economic infrastructure, as developed countries are normally sophisticated in these areas. Therefore most studies give little guidance to a sound understanding of how schools in rural Africa can overcome these prevailing conditions. An example of the state of physical and economic resources in rural Africa is given as follows:

- There are few or no schools; buildings which do exist are in a poor condition.
- Teachers are not formally trained and there are few incentives to motivate them vocationally.
- Classes are very large
- Children are not fluent in the language of instruction
- The local economy is pastorally based and communities are nomadic Saunders (2003)

Likewise government has put in place many transformation policies within education to redress the inequalities of the past, so this research can benefit government in speeding up the process of ensuring that some of these inequalities are reduced through the provision of basic physical facilities maintenance policies within schools.

Therefore it can be seen that many former "Model C" schools as pointed out in the Research and Policy brief published by the South African Institute of Race Relations in (2011) and, to a lesser extent HOR & HOD schools, still benefit from far superior facilities and resources (financial and human) than schools that were reserved for Africans during apartheid. This is further exerted by Smit & Oosthuizen (2011: 1) who state that the liberal democratic features in our system inherently favour the previously advantaged schools. This is obviously a problem that needs to be addressed in building good quality education for all.

The hope for this research is to benefit schools that are not managing their facilities effectively, to give guidance to the DBE on the dominant maintenance issues faced by schools and ways to ensure that public assets "schools" are managed well.

1.6 Existing literature

Chapter 2 reviews readings pertaining to the topic of this dissertation which link the relationship of building conditions and learner achievement in public school in South Africa. This section also reviewed. Topics that guided the literature review were around common ways utilized to measure well managed school facilities, theories such as the impact school facilities on its learners, these theories assisted in determining the relevance of the research topic. As the research problem points out that many of the differences perceived to exist in the public schooling system are a result of the injustices of the past, therefore a critical part that was reviewed in the literature was the history of South African schools and the factors leading to discrepancies in the physical school conditions of urban and township schools.

Authors such as Asiabaka (2008) define facilities management within the school context in the literature review, this definition is expanded into basic functionalities that make school facilities conducive for learning and facilities management procurement strategies that are generally used in South African schools,

Since there are various categories of schools in South Africa, the literature breaks down the various classifications of schools which range from small to mega depending on the number of learners in a school. It was important to capture different classifications of schools so as to be able to select schools to sample for this study; these definitions are elaborated further in the literature review. The fee funding models play a crucial role in determining how a school functions hence that is why the different structures that exist in the South African system were also reviewed.

1.7 Methodology

1.7.1 Research Design Framework

This study was exploratory in its nature and followed a comparative study case study design. According to Zucker (2000), the case study method emphasizes the origins and the continuities and discontinuities in the organization or behaviour over a relatively long period of time. The purpose of this case study was to gain more insight into the phenomenon surrounding facilities management methods used in former Model C schools and previously

disadvantaged schools in the Gauteng area. The comparative study assessed secondary school facilities that are ranked as quintile 5 schools in both Model C and previously disadvantaged schools in the Johannesburg Central and South district This provides insight into two different types of school and lends itself as an intrinsic case study as defined by Yin (1994) that an intrinsic case study is undertaken to gain a deeper understanding of a particular phenomenon.

1.7.2 Research strategy

As the research problem in this study hypothesizes that injustices of the past in South Africa play a role in the variances that exist in the methods employed to manage school facilities in the public schooling system, because the problem statement identifies possible causes retrospectively this allows the research strategy to be classified as an empirical ex post facto research. This study tries to establish what is happening in the maintenance of school facilities. It questioned the status quo of school physical facilities in public schools and the variances in the various public schools.

1.7.3 Research techniques

- Semi-structured interviews with schools principals and questionnaires to people responsible for managing facilities were conducted.
- To determine the state of school facilities management strategies the officials from the Department of Basic Education were interviewed.

1.7.4 Population

- South African public secondary schools
- Schools in suburban areas, townships (Quintile 5 schools)
- Public schools (mixed sex and single)

1.7.5 Sampling plan - stratified random sampling.

The population of this research pushed the sampling plan in this direction for a number of reasons. These including there are known facts this research is focused on public schools in South Africa and the population of interest is

former c schools and township schools. According to Goddard & Melville (2001) this method of sampling is normally used when the researcher has prior information regarding certain characteristics of the population.

1.7.6 Data collection

Since humans were used as part of this study, there were concerns as to whether the results would be consistent, so in order to ensure that this research is reliable. This was achieved by rephrasing questions to ensure the reliability of the responses.

1.7.7 Ethical considerations

A number of ethical considerations were identified and considered during the data collection

- Response of participants in the way data was collected. In order to overcome this, the reliability test was used; questionnaires were rephrased in order to get consistency from the respondents.
- Bringing back painful memories of the past regarding inequality. All the necessary clearance was requested from the university and from the Department of Education.
- Safety of the researcher when going to observe the schools. All the data was collected during the day and that minimized any potential risks that could have impacted the researcher.
- The confidentiality of respondents, in order to overcome this ethical issue the names of the schools were not revealed; only pseudonyms were used.

1.7.8 Methodological Choice

This research was exploratory in its nature, because it tried to establish what is happening in the maintenance of school facilities. It will question the status quo of school physical facilities in public schools. The method used in this research was a stratified random sample; There was face to face interaction with the respondents and limited to the Gauteng area.

The sample was South African ordinary secondary public schools in the Gauteng area. The schools were selected from the list of public schools compiled and produced by the Department of Education. The selection process included the selection of two former “Model C” ordinary secondary schools in the Johannesburg South and Central regions and two previously disadvantaged ordinary secondary public schools in the Johannesburg Central region. The schools were selected from various public schools in suburban, urban, and township areas, which are ranked as

quintile 5 by the Department of Basic Education. A six step approach was used in carefully selecting the sample size this is discussed in detail in the research methodology. The Gauteng area is selected because of its historical significance. Historically, schools in this province were segregated based on their racial locations. A qualitative and a quantitative approach was undertaken through the use of in-depth interviews and questionnaires. The interviews were semi structured and the interview schedule included probing questions (see appendix A). According to Saunders *et al.* (2009) these can be used to explore responses that are of significance to the research topic. They request a particular focus or direction, observation and document analysis. The semi structured interviews were conducted with school principals and the designated custodian that oversees the maintenance of facilities. The researcher had the opportunity to interview officials from the Provincial Department of Education who are responsible for the infrastructure and projects as well Facilities Management of schools in the Gauteng region. In the interview the discussion focused upon policies and maintenance from the governments point view and thus led to more questions that were subsequently incorporated into the questionnaires. Questionnaires were also drafted and were given to the custodian of the facilities. A site visit and -physical observation of 2 former Model C schools and 2 township public schools was also conducted by the researchers. Some of the points observed the toilets, classrooms, sports grounds and the overall appearance of the school.

The instruments used during the data collection stage were the interview schedule and questionnaires which came out of the semi structured interviews with the DBE officials.

1.8 Structure of Project Report

The project report is divided into the following chapters:

Chapter One

This chapter provides a general introduction into this research topic, the problem statement and the methods that were followed to achieve the objectives of this study.

Chapter Two

Reviews related literature on the history of South African schools, the current facilities problems faced by public schools and the definition of facilities management within the context of this research project.

Chapter Three

This chapter describes the research strategies applicable for the purposes of this research and the methodologies adopted to select the sample and population of this study. This chapter outlines the ethical issues considered and how necessary actions were taken to overcome these.

Chapter Four

Assesses the policies and strategies regarding FM and maintenance as outlined by the DBE and findings from interviews conducted with official from the DBE responsible for overseeing the school maintenance guidelines. This chapter also reveals facts gathered from interviews with school principals around the implementation of facilities management strategies.

Chapter Five

Presents all the findings and gives recommendations and possible areas of further research. Responses from custodians of school facilities reveal similarities and differences in the way school facilities are managed. These findings are the collated to draw up a comparative case study of the four public secondary schools.

Chapter 2: Literature Review

2 Introduction

South Africa has a past that led to racial segregation and this had its effect on the school systems in South Africa. As a result the different race groups were kept apart from one another and received school education on a level that the state felt was appropriate for them. This brought about unfair levels of education amongst the different race groups. White South Africans were at the most advantaged followed by Indians, Coloureds and lastly African students. More funds were channelled into the white schools and very little was given to other race groups, resulting in a lower standard of education and facilities being very poor and overcrowded at other disadvantaged groups. This point is emphasized by Chisholm (2004) that in South Africa there are two distinct school systems, a small minority of "de-racialised" formerly white only schools that are responsible for a large percentage of matric passes and a majority of de facto black schools, about a third whose learners fail matric. Gallie *et al*. (1997) finds fault with the unclear policy in South Africa that the lack of rapid developments in the management area in South Africa's black schools have remained disadvantaged, while its schools for whites have continued to grow and thrive.

The Department of Basic Education (DBE) has introduced several measures to address the imbalances with regards to the core elements or the basic mix of educational resources. These measures have been put in place to ensure that a healthy physical teaching and learning environment is created. The DBE in its Guidelines Relating to Planning for Public School Infrastructure in 2012 highlights that there is still an inadequate provision of school facilities and lack of uniformity in the provision of these facilities. In addition there is difficulty in assessing the current building environment as being adequate or inadequate against clear benchmarks that have been determined in advance. Lazarus & Hauptfleish (2010) further point out that, a lot can be done to reduce the amount of subsequent maintenance work during architectural design phase. Therefore the building materials used play an important role in the time it takes for the building to decay. As studies have shown (Ogunsaju, 1998; Ehiametalor, 2005) school systems where these resources are properly managed accrue substantial benefit by way of high productivity. In many other school districts especially those in townships and rural areas, particularly those that were under resourced as a result of apartheid generally there is no clear policy on physical facilities management as compared to their former "Model C" counterparts. This is eminent in an overview presented by Gallie *et a.l* (1997) that the diversity of management practices has led to the perception that "white" schools are better organized than "black" schools and consequently to increasing numbers of "black" learners seeking enrolment in "white" schools. Now that the new government has projected democracy as the cornerstone of its policies, these perceptions must be highlighted to render holistic solutions to the problems in educational management.

This research investigated the lack of uniformity in the provision and maintenance of public school facilities in South Africa. The literature review considers the guidelines surrounding the maintenance of public school facilities in South Africa, it compares the different facilities management policies implemented in public schools in South Africa. Facilities management is defined in the context of schools and this research will also evaluate benchmarking and best practice tools available to ensure that schools are maintained evenly. It provides a critique various authors' views on the importance of maintaining school facilities and considers various arguments that define basic facilities that are required to be maintained in a school.

2.1 Facilities Management

"The basic concept of FM is supporting the primary objectives of an organization, through an integrated approach of maintenance, operating and adapting the building infrastructure so that it can support the core objectives of an organization" (Ogbeifun,2011).

It is clear from the definition illustrated above regarding facilities management, that it is a combined effort from numerous disciplines within a facility to ensure the efficient running of an organization's facilities by coordinating the secondary facilities of an organization. Therefore the structure of facilities management differs from organization to organization and it is dependent on the size and nature of an organization, as it is highlighted by Asiabaka (2008) that even schools define facilities management in a manner that best accommodates the main function of the school organization.

Though the phenomenon of (FM) has existed for a long time, but not very common in Africa, as highlighted by Ogbeifun (2011) that FM has advanced in many developed countries, but still at its elementary stages in Africa and other developing countries. The concept of facilities management plays a huge role in maintaining school facilities. According to Stewart & Smith (2007) facilities are maintained in order to ensure that the elements or sub –elements are in a serviceable state so that they can fulfil the function that they have been designed for. Facilities are the buildings, grounds and service systems.

Therefore maintenance ensures the buildings; services and grounds are in a sound working condition suitable to allow the building to be functional. Xaba (2012) cites Leung, et.al (2004) who define facilities maintenance as aiming to provide end users with a comfortable effective & quality environment with minimum resources to enhance organizational effectiveness.

2.2 Facilities Management Strategies

2.2.1 School Facilities Management

According to Keith Alexander (2005) the aim of formulating a strategy for facilities management should be to achieve an intentional fit between core business needs and the provision of facilities management. In any organisation the FM model supports the primary functions of the organisation and Alexander *et.al. (*2008) points out that an organisation should rely on its primary objectives to drive the strategic objectives, an example that Alexander makes is that in higher education institutions there are constant changing market forces, new legislation, technology and economic conditions that drive the FM processes

Asiabaka (2008) defines school facilities management as the "Application of scientific methods in the planning, organizing, decision-making, co-ordination and controlling of the physical environment of learning" Asiabaka also emphasizes that the reason for the collective definition of school facilities management is to ensure that educational goals and objectives are met amongst other things. Asiabaka (2008) further expands the definition of school FM to be, collective decision making in relation to selection of site for establishment of new schools, design and construction of new school plants including grounds, renovation and modernization of old plants, provision of equipment for academic and non-academic activities, maintenance of all facilities and review of management practices and processes. School buildings consist of the external building envelope, which comprises of the building foundation and external walls of buildings, which, in conjunction with the roof, windows and external doors, separate accommodation from the external environment and protects the interior from dampness, moisture, and the provision of reasonable levels of thermal comfort Coll & McCarthy Architects,(1998). Xaba (2012) further defines school facilities maintenance as an organizational activity carried out by the school community in order to prolong the life expectancy of school buildings, its furniture and equipment.

A study carried out by Leung & Fung (2005) identified FM as the main contributor to improving learning behaviour. So in the context of schools FM refers to the collective repair and replacement of physical features as found in school buildings, grounds and safety systems (Manual for the Maintenance, Repair and Renovation (2009). One other aspect that is linked to FM is "Repair and Renovation" " and this refers to any activity or improvement to a facility, if necessary to the physical plant and grounds and repairs maintains, conserves or protects the state of condition or efficiency of the facility up to the facility's original condition of completeness or efficiency.

Lavy (2008) notes that according to the Facility Management Institute (FMI), FM is grouped in job responsibilities and is broken into the following functional groups:

- Long facilities planning
- Annual Facility Planning
- Facility financial forecasting and management
- Real estate acquisition and/or disposal
- Interior space planning, work specifications and installation & space management
- Architectural & Engineering planning and design
- New construction and/or renovation works
- Maintenance and operations of the physical plant
- Telecommunications integration, security and general administration services.

According Ogbeifun (2011) FM as a unit focuses on facility planning, real estate & building construction, building operation maintenance and general office. FM is not only limited to the abovementioned units, but it is flexible depending on the type of organization it is applied to. As pointed out by Ogbeifun (2011) that in an educational facility the operation and maintenance of infrastructure is an important support service towards teaching and research.

2.2.2 Facilities Management Regimes in Public Schools

It is important to drive a vision on the life cycling of a project from project planning, briefing, and design & commissioning, and through operation & maintenance. As pointed out by the National Department of Basic Education discussion document (2011) “The life of facilities is generally extended through a number of renovation and redevelopment projects through to eventual closure, decommissioning and deconstruction. “As depicted in Figure 1, it is clear the portion for maintenance takes up a huge part of the project life cycle.

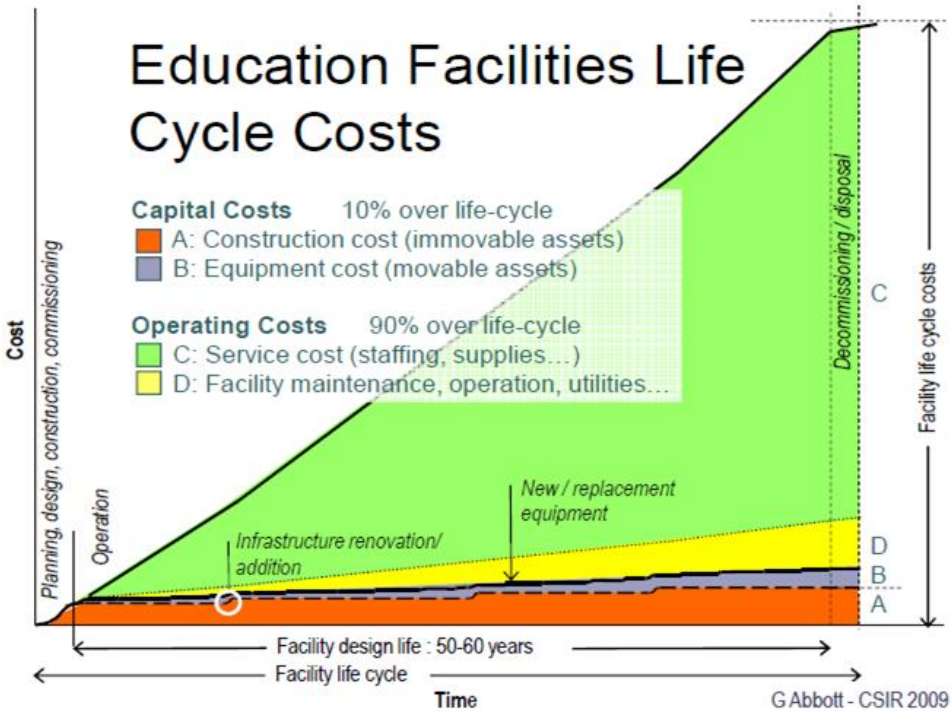

Figure 1: Education facilities life time costs-(CSIR 2009)

The provincial department of education is aware of the importance of routine maintenance of school facilities in South Africa, the department notes that the state of school facilities is generally unacceptable and its objective for basic education and schooling guided by the South African Schools Act is improved school maintenance to attain this objective. Therefore it is envisaged by the Provincial Department of Education that planned maintenance services should have the following impact on school facilities.

- Prevent current deterioration of schools which results in learners under trees and expensive infrastructure backlogs
- Lower long term life-cycle asset costs
- Sustainable job creation
- Improve learning outcomes, by improving morale and concentration
- Community ownership and care of their schools
- Learning through doing within schools and communities
- Improved financial management

In order to retain the value of school infrastructure as an investment, it is important to maintain the building in a condition that assists schools to fulfil its main function. Olajide & Afolarin (2012) point out that building maintenance work is done to ensure that the building is in a healthy condition in accordance with specified standards. BebaObong, *et al.* (2010) contend that for the aesthetics of a school environment to be maintained, efforts need to be made for regular painting, and maintaining the quality of the building which includes the channelling of sewage, well planned landscaping and trimming of flowers, clearing of grass and the correct disposal is another aspect of managing a school environment.

Though one prevalent factor that stands out when various authors address school facility maintenance is that it is "important to appropriately staff the school facilities with custodians and maintenance workers" Bello & Loftness (2010), the reality is Facility Managers in public organizations are faced with more stringent budget constraints than those in most private organization Lavy (2008).

As such, it is important to define FM in a context that best suits the objective of this study, which is ideally FM in the public sector in this case being schools. Xaba (2012) categorizes FM into the following maintenance components:

- Maintenance Organization – Refer to creating an organizational structure which defines the roles and responsibilities and this varies from school to school. SGB in public schools are the custodian for facilities maintenance and the SGB should ensure that the facilities maintenance duties are undertaken on a regular basis.
- Maintenance Inspection – This refers to school building examination in order to prepare a school maintenance plan and through this is gathering information to form the basis for the maintenance programme using forms of inspection checklists. According to Hauptfleisch & Lazarus (2010) this includes condition based assessments which includes predetermined inspection and analysis of asset performance and maintenance requirements.
- Maintenance Planning – This relates to the formulation of a maintenance strategy to make sure the optimum use of the school facilities is achieved.

2.2.3 Facilities Management Procurement Systems

Procurement refers to the different contractual arrangements that an organization can adopt for the implementation of infrastructure development & operational functions. The following agreements are available for procurement

- Outsourcing – this is used when the services and activities are of secondary importance
- In-house –Carried by and internal resource

- Out tasking - Where specific tasks are performed by a contractor
- Partnership – Includes an allowance created between the client for the delivery of the service
- Managing agent – Client appoints agents to manage the clients services
- Total Facilities Management –
- Management and operation support of support services

2.2.4 International Best Practice/Benchmarking

This research focuses on two different types of schools in the South African public school system and benchmarking is a concept that will be looked at in the way best practices in the schooling systems can be utilized. Authors (Lazarus & Hauptfleish :2010, Lavy 2008) describe benchmarking as the identification of best practices where data from other facilities is compared to other similar facilities, which includes the application of efficient procedures in order to implement better solutions for identified problems. Various authors define benchmarking as a tool that assists companies identify industry best practices it may be inside the organization (internally) or externally. Ogbeifun (2011) cites that benchmarking involves "identifying point of reference (a benchmark) which serves as a standard against which relative performance may be judged, in relation to competitors or best practice". Though Ogbeifun (2011) highlights that benchmarking has been viewed with some doubt in the Asia Pacific Region, it has subsequently become a tool that is accepted in measuring performance in FM practice worldwide. Since it is the responsibility of the state to provide quality education, Building of Educational Success Together (BEST) (2005) points out that to meet this goal the condition of their school facilities needs to be determined and that the state should measure these factors against one another to determine each facility's education adequacy BEST (2005) further points out that when substantial public investment is made in facilities, the maintenance and upkeep are in the public interest. Regular maintenance ensures that facilities will have a long and fruitful life.

Routine ranking of the performance of school facilities allows the schools to measure it facility performance against other schools and hence continuously assessing the quality of schools support services against best practices allows the school to create environments that are suitable and conducive to learning.

2.2.5 Facility Condition Assessment

Lavy (2008) notes that another way to understand the existing condition of the system and components of a building is through facility assessments also known as a "facility audits". This process assists in identifying, evaluating and reporting on the physical conditions of the building, building grounds, utilities and equipment. Therefore facility

assessments may be used as a benchmarking tool to measure the condition of the physical facilities inside the organization. Evaluating building facilities routinely through facility assessment prevents situations where buildings deteriorate over time and the effects go unnoticed, until they require emergency repairs.

2.3 Measuring the effectiveness of well managed school facilities

Various authors look at school facilities and their relevance to contributing to the schools learning outcomes differently. Some authors such as Roberts (2009) argue that both reasoning and empirical evidence suggests that if school facilities are assessed in engineering terms, then little connection to educational outcomes is evident. By contrast Earthman *et al*. (1995), support the relevance of utilizing an educator's perspective on school facilities when exploring for relationships to learning outcomes. In practice, obtaining an educator's perspective distils to obtaining the perspective of principals or teachers, since these are the role players who experience and interpret school facilities through an educator's lens. Earthman *et al*. (1995) both reasoning and empirical evidence suggests that when school facilities are examined in either descriptive or evaluative terms by educators then meaningful connections to educational outcomes emerge. In short, it appears that taking purpose into account does matter when making school facility assessments.

Gibberd (2007) highlights another measurement tool that was used by the Council for Scientific and Industrial Research (CSIR) was the School Infrastructure Performance Indicator System (SIPIS) project to help address questions by investigating the performance of school infrastructure and establishing how to measure it. At the same time, however, the government wishes to ensure that schools with good provision do not deteriorate and that all school infrastructures continues to be improved and is up-to-date. In a working paper released by the UNICEF in (2000) Colby *et.al* it argued that physical learning environments or the places in which formal learning occurs, range from relatively modern and well-equipped buildings to open-air gathering places. The quality of school facilities seems to have an indirect effect on learning, an effect that is hard to measure.

2.4 Historical Development of South African Schools

As pointed out by Motala & Pampallis (2009) that prior to 1994, fifteen apartheid education ministries existed in South Africa: the Department of National Education, which was responsible for national norms and standards, ten Bantustan departments, and four racially-defined departments. This brought about unfair levels of education amongst the different race groups. White South Africans were at the most advantaged followed by Indians,

Coloureds and lastly African students. More funds were channelled into the white schools (Former Model C) and very little was given to other race groups (Formerly known as Model B), resulting in a lower standard of education and facilities being very poor and overcrowded at other disadvantaged groups.

State schools or government schools refer to schools that are state controlled and these schools are officially public schools. State schools are all state owned including Section 21 schools. Model C schools go back to the early 1990's and these were schools that were reserved for white pupils under apartheid. Schulze (2011) also highlights that the term is not officially used by the Department of Basic Education, but is widely used to refer to former whites-only schools. Various systems were put in place to try and rectify this as pointed out by Shirley (2008) that in an effort to remedy this quality of education amongst the different race groups the government introduced different schooling systems. In 1990 the Minister announced that parents with children in former white schools could choose three school models on how the school would be run in the future' namely Model-C, Model-B and later on the Model-D system. This was in attempt to allow certain government owned schools to become more centralised which would subsequently make more funds accessible to previously disadvantaged schools. Though many authors like Gallie *et al.* (1997) critique recent educational management policy reports, highlighting the possibilities and constraints of their recommendations. Gallie *et .al* (1997) further consider whether the current thinking about educational management at the legislative level accurately assesses the legacy of apartheid and offers a viable alternative framework for reconceptualising educational management development in South Africa

In 1992 it was announced that the House of Assemblies (white) schools would become "Model C" as depicted in Table 1: Ex Department & Revised Names 1, the state funding would be used entirely for staff salaries including administration. All staff would be selected and appointed by the governing body. A governing body is a parent teacher association, which is elected by parents with representatives of teachers and learners also being members. Additional staff members can be appointed but are paid for by the governing body.

Model B would remain state schools. State funding would be used partly for staff salaries and partly for operations and administration. All staff would be appointed by the Education Department. The building maintenance would be the responsibility of the State and the Minister of Education would determine the pupil's admission policy and school fees were not compulsory and not enforceable Shirley (2012). Model A would become fully private.

Table 1: Ex Department & Revised Names 1

Ex Department	Revised Name (1992)
White(House of Assemblies)	Model C
Indian(House of Delegates)	Model B
Coloured(House of Representatives)	Model B
Black(Department of Education and Training)	Model B

Though Christie (2010) points out that it would be flawed to conclude that all schools that were historically disadvantaged perform badly and the school environment is characterized by unkempt school premises, rundown buildings, damaged and inadequate furniture no waste collection facilities and substandard toilet facilities and have deficient leadership and management practices. Kamper (2008) points out that challenges of poverty and its impacts can be overcome substantially in South African high-poverty schools through leadership which is energetic, compassionate, innovative and empowering. Leaders that use this style summons people to succeed according to Kamper (2008). Invitational qualities demonstrated by the leader supports others in their attempt to succeed Burns (2007). Spaull (2012) argues that even 18 years after racial segregation has been abolished schools that served predominantly white students under apartheid remain functional, and while those that were reserved for black students remain dysfunctional and unable to impart the necessary knowledge. Spaulls (2012) findings also revealed that where two different data gathering methods are used, the results show that when splitting the student performance by former-department, language, or socioeconomic status there is a variance. A likely contributor for these variances is the strength of the School Governing Body in a school, since it is the role of the SGB to oversee the maintenance of the school facilities, but Mncube (2009) points out that the perceptions of parents of their role in the democratic governance of schools in South Africa still shows some reluctance from parents in township and rural schools to join SGBs hence have a limited contribution in the decision making process and as a result Mncube (2009) attributes this to a low level of educational background or power struggles within the SGBs.

2.5 Problems with School Environment and Facilities

The Minister of Basic Education was quoted in an article by the Mail & Guardian (2013) “School infrastructure is an area of great concern which we have also paid serious attention to as a sector,” Problems with regards to poorly maintained schools as highlighted by the minister is a phenomenon that has been experienced in other countries as pointed out by Lunenburg (2010) that many school board officials are aware of schools’ environmental and structural problems, but have left them for the next generation. Lunenburg (2010) contends that not paying attention to the

state of inadequate school facilities in the USA, has had a huge cost implication that will result in schools that are not adequate and the longer the process is delayed the more of an impact it will have on the cost of education for future generations to come. In the USA as pointed out by Bello & Loftness (2010) insufficient funding of school facility maintenance has led to a situation where a significant number of schools need major repair and renovation. Lunenburg's (2010) study revealed that although it is recommended by experts in the facilities management fraternity that schools need to allocate 5% a year for repairs and replacement, recent findings suggest that schools allocate only 3% and that the investment in new construction is equally insufficient. Further to that Lunenburg (2010) argues that many school board officials in the USA are aware of schools' environmental and structural problems but have left them for the next generation to resolve.,

This may also be a reality in South Africa because degradation over time means that many schools in South Africa now need urgent maintenance to ensure environments are suitable for teaching and learning, and to avoid expensive unplanned repairs (SAICE 2011). This argument is further emphasized by Xaba (2012) whose general discovery was that schools especially in townships in South Africa were poorly resourced and had old school buildings and were in need of restorations and township schools had fewer custodial workers and overall human resources that looked after school facilities. Though the norm seems to be that a greater percentage of township and rural schools in the public sector require urgent maintenance. Gibberd (2007) highlights that after conducting a project called the School Infrastructure Performance Indicator System (SIPIS) it is pointed out that there are some schools in South Africa that have excellent infrastructure and those that lack basic services, but Gibberd (2007) further echoes the argument raised by Xaba (2012) that "Apartheid policies have left a legacy of large school infrastructure backlogs, in what we investigating the performance of school infrastructure there was a difference informally black areas while provision in formerly white schools appears relatively lavish, with schools provided with well-equipped laboratories and irrigated sports fields". Gibberd (2007) These arguments, which are raised by various authors regarding the variances in the school facilities, brings to the fore a number of questions which are raised by a report from CSIR by Gibberd and Mphutlane (2007) on performance of school infrastructure and these arguments resonate very well with the research questions that this study attempts to address, as follows

1. Should most resources be allocated to schools where infrastructure is poor?
2. How should school infrastructure be improved over time?
3. Which aspects of school infrastructure should be tackled first?
4. How can urgent backlogs be prioritized within a framework that also ensures improving the overall performance of school infrastructure in the long term?

The above highlight the noticeable variances within school facilities maintenance and the questions that still linger even post the abolition of the injustices that created the unfair systems in schools. "This is no simple matter to adjust

– but ignoring it is likely to mean the perpetuation of initial inequalities. The historical legacies within the system may diminish, but are unlikely to disappear of their own accord as time passes, unless there are targeted interventions to address them." (Christie, 2007)

2.6 School Environment and Facilities

Secondary and Primary education in South Africa at a National level are administered by the Department of Basic Education (DBE) and at provincial level each of the nine provinces has its own education department. The nine provinces are all broken up into districts. Districts act as a link between the Provincial Education Department (PED) and schools. They are substructures of the PED. The districts present a day to day running of the school. The Gauteng district is divided into 17 districts namely:

Ekurhuleni South, Gauteng East, Sedibeng East, Sedibeng West, Johannesburg East, Johannesburg North, Johannesburg Central, Johannesburg South, Johannesburg West; Gauteng North, Gauteng West, Tshwane North, Tshwane South and Tshwane West

As this research focused mainly on secondary schools in the Gauteng area, it was beneficial to determine the various sizes of schools and their sizes. The Gauteng district consists of 720 schools, of which 598 are public secondary and 122 independent. The district has 278 non-school fee paying schools. The great majority of these schools are to be found in former black African townships. The DBE categorizes the secondary public schooling structure within South Africa as follows:

Secondary Schools Grades 8 to 12 are classified into -

Table 2: Classification of Secondary Schools 1

Type	Number of Schools in Gauteng	Minimum Capacity	Class/es per Grade
Small	15	Minimum of 200 learners	Two
Medium	39	Minimum of 401 learners	Up to three
Large	152	Minimum of 601 learners	Up to five
Mega	392	Minimum of 931 learners	

From the Table 2 it is evident that the majority of schools fall into the “Mega Secondary School” category.

Public Schools in South Africa have basic guidelines that the DBE uses to grade the environmental functionality of school infrastructure in the Guidelines Relating to Planning for Public School Infrastructure (2012), the levels of functionality are classified as follows

- Basic Safety
- Minimum Functionality
- Optimum Functionality
- Enrichment

Basic Safety is outlined in the DBE’s guidelines and it questions whether there are factors present in school in environments which may cause harm to learners and educators and hamper carrying out the core functions of a school. The guidelines further points out that the following attributes would contribute to a school not meeting the basic safety requirements:

- A lack of access to potable drinking water and sanitation facilities.
- Toxic substances in the school environment
- Extremely unsafe building structures that could collapse
- Classrooms that are overcrowded; and
- Inadequate fencing

Minimum Functionality looks at whether the school has the resources and facilities that will enable it to perform the core functions of a school at the minimum acceptable level.

A school environment is considered to meet optimum functionality if it meets minimum functionality while also having a high level of resources and facilities accessible to learners and educators, such as

- Classrooms;
- Adequately-sized classrooms;
- Specialised teaching spaces;
- Staff preparation room;
- Administration block;
- Multipurpose classrooms;
- General purpose school hall;
- Laboratories for science, technology, mathematics and life sciences, as may be required;

- Adequate equipment;
- Library or library stocks that are regularly renewed; and
- Computer rooms or media centres.

For purposes of this research, the grading areas of school functionality that will be focused on is the basic safety and minimum functionality. These are highlighted by the DBE as the basic functional standards that a school should have. These two functionality requirements drawn from the DBE's guidelines have a link with attributes that have been identified by other authors even though there may be a few variances there are more common traits that are pointed out by authors such as Earthman (2002) who states that school building design features and components that have been proven to have a quantifiable impact on student learning, were those impacting temperature, lighting, acoustics and age. Further to that, other additional features that have been found to have a negative impact by Earthman (2002) were overcrowded school building and classrooms. Overall Earthman (2002) found that in instances where learners attend schools in substandard buildings that they are definitely crippled in their academic achievement. The minimum norms and standards highlighted above will direct the research towards the basic functionalities that can compared between the different public school facilities management systems.

The Gibberd & Mphutlane (2007) developed a model for defining building performance in schools into three areas:

• Infrastructure: - Infrastructure should be able to inherently perform well. This includes ensuring that buildings are weather tight, structurally sound, have low operating costs, and are spatially and resource efficient.

• Programme: - Infrastructure should effectively support the activities that it is required to accommodate. For instance, school buildings should accommodate the current curriculum and preferred modes of teaching and learning.

• People: - Infrastructure should allow users to be comfortable, healthy and productive and should meet users' basic needs. It should also guarantee that human rights are respected.

In a study carried out by Smith & Stewart (2007) which was aimed at providing details on the process involved in preparing a comprehensive maintenance audit of school buildings and facilities in a state government education department in Australia, the following buildings and grounds elements were reviewed on the site under three main categories:

Site - consists of fences, paving, sealed and unsealed areas and services to the whole school such as storm water, drainage and water services;

Building(s) – exterior or external parts (elements) of the buildings consisting of the structure, external walls, windows, roof, verandas and services; and

Rooms of buildings – all internal spaces including ceiling, floors, walls, doors, fittings & equipment, electrical and mechanical services.

It can be deduced from the various researchers, that certain features have the greatest impact on learner outcomes and most of these characteristics are those that are encompassed in the South African DBE guidelines on basic and minimum requirements for school functionality. Hence in order to achieve optimum results for this research, the focus will outline facilities management maintenance around basic and minimum requirements of public schools in South Africa.

2.7 Policies for School Infrastructure in South Africa

The DBE has set a 5 year strategic plan for 2009/10 – 2014/15. This plan attempts to tackle new strategic priorities and invest in infrastructure, but the department is aware of the back logs with regard to provision of new infrastructure and the required rehabilitation and preservation of the Departments infrastructure profile. The intention of the programmes around the strategic plan is to address the following:

- To develop and implement a plan to eradicate the era of broken windows and dysfunctional toilets through the rehabilitation and maintenance of schools.
- To make schools safe by erecting fencing
- To address overcrowding through the use of mobile classrooms
- To develop a standard design for schools in the Gauteng province, so that schools can be a sign of national pride and are an effective environment for learning and teaching.
- To work with other governments to develop and implement an integrated plan for infrastructure development.
- To look at ways to improve the quality of sustainable education (Five year strategic plan 2009/10-2014/15).

The strategic plan 2009/10-2014/15 aims to increase the maintenance budget in the long term, as shown in Table 3 below. Expenditure for maintenance is planned to grow by almost 35% percent in the year 2009/10 – 2014/15.

Table 3: Five year strategic plan 2009/10 – 2014/15

Year	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15
Payment for infrastructure by category	*ZAR*					
New Infrastructure	535,376	640,741	511,413	236,433	488,000	811,300
Existing Infrastructure	219,334	722,304	951,790	1,301,430	1,128,256	887269
Maintenance & Repair	46,859	65,133	71,068	80,663	93,610	109,682
Upgrading and additions	145,193	245,557	208,020	225,267	236,046	258,497
Rehabilitation and refurbishment	27,282	411,614	672,702	995,500	798,600	519,090
Current Infrastructure	46,859	65,133	71,068	80,663	93,610	109,682
Capital Infrastructure	707,,851	1,297,912	1,392,135	1,457,200	1,522,646	1,588,887
Sub Total	**754,710**	**1,363,045**	**1,463,203**	**1,537,863**	**1,616,256**	**1,698,569**
Furniture	25,000	30,000	30,000	30,000	30,000	30,000
Total Education Infrastructure	**779,710**	**1,393,045**	**1,493,203**	**1,567,863**	**1,646,256**	**1,728,569**

Source Department of Basic Education 5 year strategic plan 2009/10 – 2014/15

It is clear from Table 3, that the DBE has set aside funding to achieve maintenance backlogs in schools and this is allocated to give schools rehabilitation/renovation a major boost.

Secondary and Primary education in South Africa at a National level is administered by the DBE and at provincial level each of the nine provinces has its own education department. Power of running schools is not only limited to national and level but power is also passed to the elected School Governing Bodies (SGB) which have a significant say in the running of schools ,in partnership with government they share the responsibility of developing and maintaining schools at a local level. One of the roles and responsibilities that are transferred from the state to the SGBs as outlined by Karlsson (2002) are environmental matters such as property administration. The South African Schools Act (Act No.84; 1996) states that the SGB must:

- Administer and control the school's property, buildings and grounds occupied by the school. All reasonable use under fair conditions of the facilities of school for educational programs not conducted by the school.

- Allow the reasonable use of the facilities of the school for community, social and school fund-raising purposes, subject to such reasonable and equitable conditions as the governing body may determine which may include the charging of a fee or tariff which accrues to the school.
- Maintain and improve the school's property, and buildings and grounds occupied by the school (South African Schools Act Republic of South Africa, 1996b, sections 20 and 21).

It is noted by Mncube (2009) that each community(meaning each school) has distinctive needs and therefore the functioning of SGBs varies from school to school and because of the greater managerial expertise among the parents in former Model B schools, they operate more effectively than other schools and they are also vast differences between urban and rural schools. Mncube (2009) also notes that there is a high reluctance of parents in township and rural schools to join SGBs and the result is that they have a limited contribution in the decision making process the probable cause for this is low level of education and power struggles among parents in township schools. This argument is further emphasized by Christie (2010) who argues that school governing bodies of the best functioning schools in the system are mostly schools that were previously reserved for white and Indians and are able to utilize their various resources (financial or social) to ensure the schools benefit.

2.8 Funding Public Schools in South Africa

The South African Schools Act (SASA) imposes responsibilities on the state with respect to funding of schools. The act requires that "The state must fund public schools from public revenue on an equitable basis in order to ensure the proper exercise of the right learners to education can the redress of past inequalities in educational provision". Therefore the Provincial Education Departments (PED) is allocated funds by the state to decide how much is to be apportioned to its education departments. SASA also imposes a responsibility on all SGBs ensure that they complement and support the quality of education in their schools by adding and improving on those provided by the state from public funding.

2.8.1 Targeting Schools on Basis of Need

In order to achieve greater social equality in school funding each provincial department of education is required to produce a list of schools in its province and the condition of the school and the poverty in the community served by the school. Schools are then divided into socio economic indicators. At one end there are Quintile 1 and 2 schools, these are schools in extremely poor communities and on the other hand are schools that are classified as Quintile 5 these are made up by a majority of white schools. Schools ranging from Quintile 3-4 are the norm in South Africa. The method used to classify the schools is determined by the schools poverty ranking and its surrounding community. The Treasury classifies the schools. They use poverty areas based on data from the National census including income levels, dependency ratios and literacy levels. Provinces then rank schools into quintiles based on catchment areas. The quintile ranking of the school determines their non-fee status. Generally Quintile1 and Quintile 2 schools were identified as "no fee school" Hall (2008).The poorest schools (Quintile 1 and 2) receive the greatest per learner allocation and therefore schools in wealthier communities receive less funding per learner as it is assumed that these communities are better able to raise funds.

2.8.2 No Fee Schools

As discussed above "no fee" paying schools are schools where pupils are not required to pay fees. No fee paying schools are published by government on an annual basis (normally Quintile 1; 2 and 3) or former Model B schools are non-fee schools. It is reported by the South African Institute of Race Relations (SAIRR) that "Anecdotal evidence indicates that people who are entitled to send their children to no fee schools still prefer to send them to schools that require pupils to pay fees". Hence it can be assumed that many parents are still concerned about the quality of non-fee schools. This is further contended by Roodt (2011. Per Comm).

"It does not help having no fee schools that do not provide pupils with a decent education."

As this study will focus on two school models it was imperative to unbundle the definitions of schools in South Africa and it is obvious there are various categories of schools, and this may render differences in the school facilities. The SASA identifies two kinds of schools: Section 20 and Section 21 schools. Section 21 schools have greater powers and responsibilities than Section 20 schools.

2.9 Minimum and Optimum Norms and Standards of School Infrastructure

The Department of Education, as it was previously called, guided by the National Policy for Equitable Provision of and Enabling School Physical and Teaching and Learning Environment (policy document(2007) developed Norms and Standards for School Infrastructure (2008) these norms were approved by the National Policy. The policy provides minimum and optimum norms and standards and also presents a gradation of provision. The gradation system is classified as meeting norms & standards for safety functionality & effectiveness. The guidelines further highlight schools that do not meet the minimum safety and functionality norms referred to as comprising a "backlog" and if a school does not meet aspects of the norms & standards, guidelines will be retrofitted into such a school to ensure that it fully meet basic minimum standards.

There are certain schools that may have been provided for beyond the norms and standards. The national policy for norms and standards for infrastructure permits this and refers to such schools meeting these levels of provision as "Enrichment Norms & Standards". The nature and mix of schools meeting the Enrichment levels may vary depending on the strategic needs of the country.

2.9.1 Department of Basic Education School Procurement Systems

Gauteng Provincial officials may use a variety of procurement methods to effect repairs and maintenance, as defined in the "Standards for Uniformity in Construction Procurement" (CIDB 2009, gazette 31823,).

The SASA can in certain instances during a buildings life allow that major rehabilitation work to be carried out by the SGB and /or School Management Teams (SMT), but because the funds required for rehabilitation work in most instances will exceed school budget as a result major maintenance work still remains the responsibility of the Provincial DBE. Though in a discussion paper released by the DBE (2011) it is pointed out that there is still an unclear line between the roles that are to be undertaken for maintenance work by the Provincial Department and the SGBs, but the DBE gives the following as guidelines for planned maintenance work.

Table 4: DBE guideline on planned rehabilitation

Provincial Department – Major Maintenance Work	**SGBs and School Management Teams(SMT's) – Minor Maintenance Work**
The roof trusses are rotten or broken	Replacing doors and windows
Cracks in a wall more than 5mm wide	Repair water systems, plumbing and toilets
Rehabilitation or replacement of severely damaged buildings	Repair the electrical system
Additional classrooms and administration blocks	Emptying toilets
Major rehabilitation of buildings	One building to be repaired and painted every year as necessary
Major civil work for the storm water system	Repair and paint the roof of one building each year to ensure that every roof is painted every 5-15 years.
Termite treatment	Termite treatment every 5-10 years as necessary
Roof	Repairing roof leaks, cleaning gutters and storm water drains every year

In a discussion document released by the National DBE (2011), it is noted that the general state of routine school maintenance of school facilities is generally unacceptable. This has ultimately resulted in the decay of school facilities over time which poses a safety and health risk to learners, teachers and users of the school facilities. Thus, the question that arises is; who is responsible for overseeing that the routine maintenance is undertaken in the school facilities? According to the National Department of Education, the role of different bodies responsible for administrating the maintenance of schools facilities is defined clearly in the legislation. Even though legislation defines the roles and responsibilities of authorities that are responsible for school facilities. Ikoya (2008) points that in Nigeria the government, has transferred several school management functions to local, districts and even village units. Further to that there have been a number of privatization programmes in the education sector, but Ikoya (2008) cites that there has not been any empirical evidence that proves that school facilities are better managed in decentralized or centralized schools Hence the recommendation made by Ikoya (2008) is that to unravel some of

these answers, more focus should be put on the preferred management structure that would strengthen the availability, adequacy and functionality of schools physical facilities in Nigeria secondary schools.

The role of the DBE is defined in the legislation as follows.

- Section 38(1) (d) of the Public Finance Management Act (PFMA), No 01 of 1999 stipulates that the accounting officer for a department is responsible for the management, including safeguarding and the maintenance of the assets of the Department.
- The Government Immovable Asset Management Act (GIAMA), No 19 of 2007 promotes the efficient utilization and maintenance of existing immovable assets, (Section 5(1) (d)).
- The South African Schools Act (SASA), No 84 of 1999 defines the roles of the Department of Basic Education (Provincial, District, Circuit, School Governing Body and School Principal) to maintain and improve the school property and buildings and grounds occupied by the schools, including school hostels. Guidance on provincial funding to schools and its use are defined in the SASA Amended national norms and standards for school funding (Gazettes 29179, 32683, 33723 and 339471).(National Department of Education 2011)

Therefore, it is clear from legislation that the three legislative authorities required to work together in order to ensure that the management and overseeing of the FM of school infrastructure is undertaken are:.

1. The school principal and SGB;

2. The circuit and/or district management;

3. The Provincial Infrastructure Directorate

The power that each legislative authority has in managing the school facility is also dependant on the status given to the school. All public schools are deemed section 20 schools and all SGBs exercise the functions detailed in this section of SASA. Though section 21 schools have extra functions which can allocated to SGBs of schools that are seen as having the capacity to undertake them. Most of these additional functions usually come with an added financial burden and do not add significantly to the powers bestowed upon the SGB. Therefore different procurement systems apply in section 20 and 21 schools, outlined below.

2.9.2 Section 20 Schools

Receive allocations of textbooks and stationery from government. They also have their lights and water accounts paid directly by government. When something is broken at the school, the Education Department must send someone from Public Works to do the repairs

This budget will be managed at District or Provincial level. It is recommended that Provincial Departments should inform the Director General in writing on how the province plans to manage maintenance and repairs at non-Section 21 schools before 30 August each year, and include these plans in the User Asset Management plan (UAMP) and Infrastructure Program Management Plan (IPMP), which are also due before 30 August each year.

District or Provincial management may use a variety of service providers to effect repairs and maintenance:

- The local Public Works cost centre inspects the school, prepares a quotation for the school to approve; the school buys the materials, the Public works cost centre provides the labour, management and supervision to carry out the repairs, supervise and manage the process;
- The District gets 3 quotes and contracts a service provider to do the work, which are paid from the school fund;
- Where the provincial Department has a term service contract in place for maintenance work, the contracted service provider does the work and is paid either from the schools fund or from the district or provincial budget.

2.9.3 Section 21 Schools

Are allocated finances by the department and are responsible for ordering stationery, textbooks, paying water and lights accounts and undertaking their own maintenance. They can also decide on what subjects the school can offer and what sports and other extramural activities the learners can take.

Where the Member of the Executive Council for Education has allocated full responsibility to a school governing body under section 21 of the SASA, a budget allocation is transferred from the Provincial department into each school fund, to be managed by the School Principal and SGB.
The SGB is required to use these funds as follows:

- To maintain and improve the school's property, and buildings and grounds occupied by the school, including school hostels, if applicable;
- To determine the extra-mural curriculum of the school and the choice of subject options in terms of provincial curriculum policy;
- To purchase textbooks, educational materials or equipment for the school;
- To pay for services to the school; or
- Other functions consistent with this Act and any applicable provincial law. (South African Schools Act, 1996, section 21).

School principals may use a variety of service providers to effect repairs and maintenance as follows:

- The local Public Works cost centre inspects the school, prepares a quotation for the school to approve; the school buys the materials; the Public Works cost centre provides the labour, management and supervision to carry out the repairs, supervise and manage the process;
- The school gets 3 quotes and contracts a service provider to do the work, paid from the school fund;
- Parents, Learners or Community members volunteer to do the work;
- Where the provincial department has a term service contract in place for maintenance work, the contracted service provider does the work and is paid either from the schools fund or from the district or provincial budget trusted up to a supplier

2.10 Summary

The basis of the literature review is directed firstly by the history of South Africa; because this research hypothesizes that the racial segregation in the country has contributed to variances in the management of school facilities in the public schooling system. It was important to address the South African past by addressing the historical developments of schools, of which it became evident as the literature took form that schools in townships and urban areas were divided based on race, and were then either classified as “Model B” or “Model C”.

The definition of FM highlighted that in schools, FM is generally a way of controlling the physical environment through activities such as coordination, decision making and planning. So in order to measure the most effective way to assess well managed school facilities the literature review highlighted that there seems to be varying standards around measuring well managed school facilities. These range from assessing elements that allow a school to have basic functionality in engineering terms, or to evaluating using an educator’s perspective. Therefore these two

measures, assisted in the data collection because engineering elements were observed and the educators perspective by interviewing principal and custodians of school facilities was used. So the observations and interviews were directed by levels of functionality required in the school environment such as basic functionality to optimum functionality as categorized by the DBE.

Another key factor that plays a crucial role in the way school facilities are managed is the funding structure in a school. The funding models in public schools highlighted that most previously disadvantaged schools are classified as non-fee paying schools, where they are fully subsidized by the department of Education as opposed to fee school fees which are mostly former Model C schools.

The topics addressed in the literature review, allowed the questionnaires to be classified into four categories , either as a physical fabric condition which is directly linked to the school environment, or as questions that attempt to assess operational processes and methods which is more about issues around the coordination, planning, maintaining and controlling of the school environment. The last category was the facilities management policy, strategy and budgets which is linked to the topics in the literature around school funding models and the procurement systems used by schools and the schools understanding of procurement systems put in place by the DBE.

The literature has highlighted the history of South African schools, and the various definitions of school facilities management which are still at a tender in South African schools. The differences in schools are evident in most of the literature. This will form the base for the questionnaires during the data collection and analysis stage

Chapter 3: Research Methodology

3 Introduction

This section looks at the research methodology adopted for this study. The research strategy used is explained and the reason for selecting the mixed approach is described. The research technique used consisted of both qualitative and quantitative methods.

A step by step breakdown of the population and the selection process used to identify the sample as ordinary public secondary schools.

3.1 Research Strategy

The approach taken in this study is a mixed method approach. It incorporates both the qualitative and quantitative methods. This type of concept originated in 1959 as highlighted by Creswell (2003) that this method was employed by Campbell & Fiske (1959) to study the validity of pyschological traits. The procedure followed for the mixed method study will be sequential, comprising of the following steps:

1. Interview Department of Education (Facilities Management Department).
2. Identify chosen schools with the 6 step approach illustrated in Table 6.
3. Send out permission letters to school principals/SGBs requesting permssion to visit school and conduct interviews.
4. Interviews with school principals
    - School T and School R (Previously disadvantaged- Model B)
    - School M and School S(Former Model C)
5. Send out questionnaires to facility managers/ custodian of facilities

The sequential procedure used in this study closely ties up with the sequential procedure described by Creswell (2003) meaning the findings from one method (interviews) have been used to elaborate on the questionnaires. As outlined in the sequential steps above, the data collection started with a qualitative study through the use of interviews with officials from the DBE, school principals/head of SGB. This study was followed by quantitative data collection, through the use of questionnaires with the facilities manager or the custodian of the school facilities.

The sample included South African public schools in the Gauteng area. The schools were selected from various public schools in suburban, urban, and township areas. The Gauteng area was selected because of its historical significance as well its accessibility for the researcher. Historically schools in this province were segregated based on the racial locations. The sample selected used a stratified random sample. There was face to face interaction with the respondents and it was limited to the Johannesburg Central and South districts in Gauteng.

3.2 Research techniques

Cooper (1985) tried to identify the working conditions of practicing teachers through the collection of data that were open ended so as to give teachers the opportunity to express the state of their working conditions in their own words. The method of collecting data for this research is similar in that school principals and people responsible for managing school facilities were interviewed on the state of their educational FM policies and the process followed to maintain and manage these facilities.

The qualitative and quantitative approach undertaken included the use of in-depth interviews that were semi structured and they included probing questions. According to Saunders *et al.* (2009) these can be used to explore responses that are of significance to the research topic, as they require a particular focus or direction, observation and document analysis. Semi–structured interviews can" assist the researcher to produce a credible report, because this tool is easy to administer, facilitate direct feed-back from those most affected by the quality of the management" (Ogbeifun:2011, Walters, 1999).The interviews were accompanied with questionnaires with administrators and operators responsible for overseeing the management of school facilities. The elements observed for purposes of this research were based on the schools physical appearance (visible damage, wear and tear).

As this research was also qualitative in its nature, interviews were conducted with representatives from the Gauteng DBE.The interview was a one-on-one session which took about 45 minutes.This assisted in revealing the view of the DBE with regards to their strategy for school FM. Though before this method of data collection the researcher was fully aware that the process would be time consuming as the interview required preparation

3.3 Validity and Reliability

In order to check the validity of the quantitative data and the accuracy of the qualitative data, the following validity procedures will be used.

- Reliability –Questions will be rephrased to ensure the validity of responses.
- To ensure reliability and validity during the semi structured interviews with the Gauteng DBE, a cell phone voice recorder was used for recording interviews in conjunction with a semi structured interview schedule as shown in Appendix A

3.4 Population and Sample

3.4.1 Population

Based on a report to the minister of education by Christie *et al*. (2007) titled "Schools that work in South Africa" it is pointed out that the "dominant perception in South Africa is that the standard of schooling is set by the privileged sector of schools" Christie, *et.al* (2007) .The majority of schools in South Africa are not privileged and in fact they reflect a minority of schools in relation to the majority of schools which are deprived. Hence the argument is that, in selecting schools that work as per Christie *et.al* (*2007),* which are schools that succeeded in meeting the demands of Senior Certificate exams and produced good and sometimes outstanding results beyond various limits such as limited resources. In South Africa the criteria had to consider the historical and contributing legacies of inequality in South Africa. Therefore schools used for comparison purposes in this research are from the mainstream of the schooling system rather than the edges of extreme deprivation.

A small sample of ordinary public secondary schools in both urban and township areas were used for purposes of this study. Schools selected are those classified as "Mega schools" by the DBE, these schools generally have between 963-1762 learners enrolled in the schools .This included in depth interviews, reading of literature and observation of school buildings. Therefore the total population for this research is formed by the following characteristics:

- South African ordinary public secondary schools
- Quintile 5 schools
- Section 21 schools- These are schools allocated funds by the department and are responsible for ordering stationery, textbooks, paying water and lights accounts and undertaking their own maintenance

- Department of Education and Training Schools (DET) -These are previously disadvantaged schools
- House of Assembly(HOA) schools – These are “former Model C” schools

3.4.2 Sample Population

The sample case studies were four South African ordinary public secondary schools in the Gauteng area, more specifically in the Johannesburg Central and the Johannesburg South District. The schools were selected using a stratified sampling method, where the norm in terms of the number of learners in secondary schools is used as a benchmark.

Two public schools which were previously referred to as House of Representatives (HOR) are used as a sample to represent former Model C schools and two public secondary schools which were previously referred to as Department of Education and Training are used to represent previously disadvantaged (Model B) schools. The Gauteng area is selected because of its historical significance.

3.4.3 Sampling Plan - Stratified Random Sampling.

The stratified random sampling technique allows the size of the sample to be any size. This allowed face to face interaction with the respondents and limited to the Gauteng area. Schools previously chosen by Christie et al (2007) in a report presented to the ministerial committee were good performing schools in the middle quintile (Quintile 3 and Quintile 4). This study highlights the extent to which urban-township differences/similarities in physical school FM remain noticeable in a country that has moved from the legacy of apartheid.

The population of this research has pushed the sampling plan in this direction as this research was focused on public schools in South Africa and the population of interest is former Model C schools and previously disadvantaged schools. According to Goddard & Melville (2001), this method of sampling is normally used when the researcher has prior information regarding certain characteristics of the population. The characteristics used in the stratification involved size of school with regards to the number of learners it can accommodate. It included the quintile ranking of the school and the previous classification of the school based on race.

In order to verify and select the relevant population for this research, the data released by the Education Management Information System (EMIS) whose sole responsibility is to provide education information to the education system was contacted. The EMIS survey assisted in selecting the appropriate schools to be used for the purposes of this study. According to the national guidelines on completing the EMIS survey for ordinary schools this

provides an indication of a complete count of learners, personnel, and details concerning the learners, resources and equipment of the school.

The selection process that was followed to identify the participants in this case study is described in the stages below to identify 4 schools from the 2300 in the Gauteng region.

Step 1: The data were arranged into the total number of schools both public and independent schools in the Gauteng area. The total number of schools at stage 1 was 2753. In Gauteng the majority of primary, secondary, combined and intermediate schools are categorized as mega schools. Nine (9)out seventeen 17 school districts have the highest number mega schools.

Step 2: The schools were then filtered into the number of ordinary public secondary schools in the Gauteng area with regards to the existing 17 education districts in Gauteng. The total number of schools at this stage was 704. The process of filtering the data from the latest EMIS survey revealed that the highest number of secondary (public and independent schools in the 17 districts all fall into the mega school category. The most number of public ordinary secondary schools fall into the mega school category. All 13 Gauteng districts had the highest number of mega schools in each district. This has aided the researcher to decide on the focus for the population for this research.

Step 3: The data excluded Quintile 1, 2 and 3 schools on the basis that quintile 4 and 5 schools, generally are fee-paying schools and most former Model C schools are quintile 4 and 5, this would allow the researcher to compare similar samples.. As discussed in the literature quintile 5 schools are made up of the majority of former Model C schools. The norm in South Africa schools is quintile 3 and 4 schools.

Step 4: The data was further filtered according to quintile 4 and 5 ranking for each district. The total number of quintile 4 and 5 schools in the Gauteng area is 219.Schools are divided into socio economic indicators. At one end there are Quintile 1 and 2 schools, which are schools in extremely poor communities and on the other end schools that are classified as Quintile 5 which make up the majority of former Model C schools. Schools ranging from Quintile 3 and 4 are the norm in South Africa. The method used to classify the schools was determined by the schools poverty ranking and its surrounding community. The norm in South Africa schools is quintile 3 and 4 schools. For purposes of this research, schools that have similar rankings will be observed and these being quintile 5 schools.

Step 5: Schools that formed part of the study were identified. The four schools selected are:

- School T and School R (Previously disadvantaged)
- School M and School G (former Model C)

Step 6: The focus of this research was in the Johannesburg Central district as it was easily accessible for the researcher. The quintile 4 and 5 list was further reduced to only focus on quintile 5 schools in the district and this resulted in 7 schools. Five of the seven schools were formerly referred to as House of Assembly (HOA) and these are the former Model C schools. Two of the seven quintile 5 schools are the sample of schools that represent the previously disadvantaged schools in the township areas.

During the research process, permission letters were sent to all principals of the selected schools, but School SJ as shown in Table 8 declined the request citing that the school had too many similar requests and they were not able to assist. A concession had to be then requested from the DBE of education to allow the researcher to also focus on the Johannesburg South region as this would allow the selection to still be a school that still fitted the profile of the research sample.

Table 5 depicts the process of reducing the EMIS list to get to the selected sample.

3.4.4 Selection of data using EMIS

In order for the selection of the sample to represent the majority of South African schools, Table 5 was filtered using the DBE EMIS to give an indication of the number of schools (public and independent) in each category, as classified by the DBE.

It is evident that the highest number of secondary schools falls into the 'mega' school category, this includes either those that have 932 or more learners enrolled into the school. Therefore the outcome of the above data allowed the selection for this study to be "mega" schools.

The EMIS data were filtered even further to eliminate independent schools, as they would not form part of this study as shown in Table 5 this table showed that the highest number of public schools are categorized as "mega" schools.

Table 5: Classification of Secondary Schools 2

	Total number of schools	Type	Mega	Large	Medium	Small
Ekurhuleni South	55	**Range**	934-2332	665-888	585	0
		Number Schools	46	8	1	0
			84%	15%	2%	0%
Gauteng East	47	**Range**	937-1979	706-930	0	0
		Number Schools	36	11	0	0
			77%	23%	0%	0%
Sedibeng East	20	**Range**	950-1768	629-755	455-581	163-254
		Number Schools	11	4	3	2
			55%	20%	15%	10%
Sedibeng West	80	**Range**	937-1979	612-923	453-514	265-336
		Number Schools	62	13	3	2
			78%	16%	4%	3%
Johannesburg East	36	**Range**	934-2292	664-920	519-579	0
		Number Schools	22	11	3	0
			61%	31%	8%	0%
Johannesburg North	39	**Range**	957-1500	710-927	511-588	303
		Number Schools	19	17	2	1
			49%	44%	5%	3%
Johannesburg Central	54	**Range**	963-1669	608-926	426-586	212-341
		Number Schools	35	11	6	2
			65%	20%	11%	4%
Johannesburg West	30	**Range**	964-1646	635-872	420-539	316
		Number Schools	21	4	4	1
			70%	13%	13%	3%
Gauteng North	18	**Range**	932-1697	606-751	406-550	355-383
		Number Schools	7	6	3	2
			39%	33%	17%	11%
Gauteng West	71	**Range**	934-1813	606-922	484-576	76-362
		Number Schools	39	23	5	4
			55%	32%	7%	6%
Tshwane North	37	**Range**	949-1713	653-880	408-536	355-383
		Number Schools	24	8	3	2
			65%	22%	8%	5%
Tshwane South	58	**Range**	933-1787	608-923	447-577	233-349
		Number Schools	25	21	4	3
			43%	36%	7%	5%
Tshwane West	53	**Range**	934-1383	602-918	443-513	233-349
		Number Schools	25	21	4	3
			47%	40%	8%	6%

The data were further filtered according to quintile 4 and 5 ranking for each district. As shown in Table 5, quintile 5 schools are made up of the majority of former white schools.

Schools are divided into socio economic indicators. At one end there are Quintile 1 and 2 schools, these are schools in extremely poor communities and on the other hand schools that are classified as Quintile 5 make up a majority of

white schools. Schools ranging from Quintile 3-4 are the norm in South Africa. The method used to classify the schools is determined by the schools poverty ranking and its surrounding community. For purposes of this research, schools that have similar rankings were observed.

Table 6: Quintile 4 and 5 Schools per Region 1

District	Quintile Ranking	Department of Education & Training	House of Assembly	House of Delegates	Bophutha-tswana	House of Representative	New Education Department	Total
Ekurhuleni South	Quintile 4	9	0	0	0	1	1	**11**
	Quintile 5	1	16	0	0	0	1	**18**
Gauteng East	Quintile 4	7	2	0	0	1	0	**10**
	Quintile 5	1	4	0	0	0	0	**5**
Sedibeng East	Quintile 4	2	0	0	0	0	0	**2**
	Quintile 5	0	0	5	0	0	0	**5**
Sedibeng West	Quintile 4	2	0	0	0	0	0	**2**
	Quintile 5	0	3	0	0	0	1	**4**
Johannesburg East	Quintile 4	0	0	0	0	0	0	**0**
	Quintile 5	1	8	1	0	0	0	**10**
Johannesburg North	Quintile 4	1	1	0	0	1	0	**3**
	Quintile 5	0	5	1	0	0	0	**6**
Johannesburg Central	Quintile 4	4	0	2	0	7	0	**13**
	Quintile 5	2	5	3	0	1	1	**12**
Johannesburg West	Quintile 4	4	0	0	0	0	0	**4**
	Quintile 5	1	8	0	0	0	0	**9**
Gauteng North	Quintile 4	0	1	0	0	0	0	**1**
	Quintile 5	0	1	0	0	0	0	**1**
Gauteng West	Quintile 4	6	3	0	0	0	0	**9**
	Quintile 5	0	11	1	2	0	0	**14**
Tshwane North	Quintile 4	5	7	0	2	0	0	**14**
	Quintile 5	0	8	0	0	0	0	**8**
Tshwane South	Quintile 4	13	1	1	0	4	1	**20**
	Quintile 5	0	20	0	0	0	2	**22**
Tshwane West	Quintile 4	3	1	0	10	0	2	**16**
	Quintile 5	0	9	0	0	0	2	**11**
							TOTAL	**219**

Table 7: Quintile 4 Schools (previously disadvantaged)

Sector	Type of School	Ex Department	District	Urban/Rural	Secton 21	Quintile	Number of Learners 2013
Public	Secondary	Departmnent of Education & Training	Johannesburg Central	Urban	Yes	4	1050
Public	Secondary	Departmnent of Education & Training	Johannesburg Central	Urban	Yes	4	1124
Public	Secondary	Departmnent of Education & Training	Johannesburg Central	Urban	Yes	4	1245
Public	Secondary	Departmnent of Education & Training	Johannesburg Central	Urban	Yes	4	1232

Table 8: Quintile 5 Schools (previously disadvantaged)

Institution	Sector	Phase	ExDepartment	District	Urban/Rural	Section 21	Quintile	Type	Number of Learners
School R	Public	Secondary	DET	Johannesburg Central	Urban/Rural	Yes	5	Mega	1469
School T	Public	Secondary	DET	Johannesburg Central	Urban/Rural	Yes	5	Mega	1145

Table 9: Quintile 5 Mega Schools (Former Model C) -2013

Institution	Sector	Phase	ExDepartment	District	Urban/Rural	Section 21	Quintile	Type	Number of Learners
School F	Public	Secondary	HOA	Johannesburg Central	Urban/Rural	Yes	5	Mega	1259
School HF	Public	Secondary	HOA	Johannesburg Central	Urban/Rural	Yes	5	Mega	1106
School P	Public	Secondary	HOA	Johannesburg Central	Urban/Rural	Yes	5	Mega	1199
School M	Public	Secondary	HOA	Johannesburg Central	Urban/Rural	Yes	5	Mega	1669
School SJ	Public	Secondary	HOA	Johannesburg Central	Urban/Rural	Yes	5	Mega	1455

A physical observation of 2 former Model C schools and 2 previously disadvantaged public schools was conducted. Mncube (2009) cites that observation makes it possible to experience what happens in the real world. Some of the points observed included but were not limited to the availability, adequacy, and functionality of schools facilities.

In a study carried out by Smith and Stewart (2007), the audit process undertaken on school facilities for auditing for on-site activities was through observation as shown in Figure 2. The processes involved in the element analysis (condition assessment) and remedial action this is the process that will assist the researcher for purposes of this research to undertake the observation exercise.

The physical observation of the school facilities was guided by the illustrations set out in the (Physical Resource Management System) PRMS manual as illustrated in above. The elements assessed for purposes of this research were based on the schools physical appearance (visible damage, wear and tear) and they were classified under one of four graded condition headings as follows:

1. Good – nothing needs to be done. No further auditing action is needed.
2. Fair – starting to show signs of wear and tear. No maintenance reason to repair or replace at this time.
3. Worn – substantially deteriorated, but still operational and functional. In the short-term, it still achieves its intended function.
4. Poor – failed and inoperative; no longer performs its required function. Repair, replace or service. Smith & Stewart (2007)

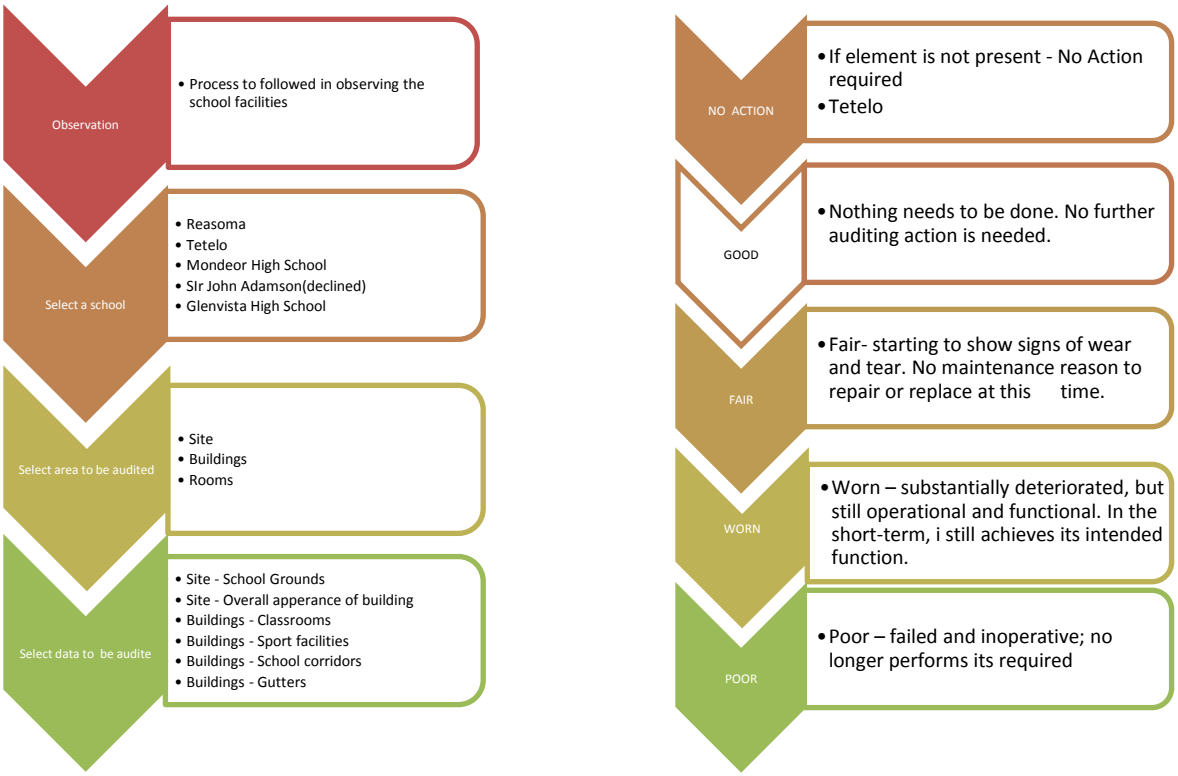

Figure 2: Observation process on the school facilities

Therefore an informal process of observing the school classrooms, toilets, grounds and external appearance of the school was undertaken this was done with the custodian of the school facilities.

In studying the various aspects of school buildings a method employed in a similar study where students were asked to investigate how different aspects of FM are implemented in higher education Lavy (2008), a similar method was applied in this research this will assisted to conclude the following about the schools

- Strategic and tactical planning – long, mid and short term planning.
- Benchmarking and implementation of condition assessment – development assessment and use
- Maintenance and repair – policy setting and how it is implemented in the different building systems(structure, exterior and interior components)
- Alterations, renovation and reconstruction management

3.5 Ethical considerations

The researcher was fully aware of the ethical issues that could pose a risk for this research, These including, bringing back painful memories of the past regarding inequality, safety of the researcher when going to observe the schools, accessing schools due to presence of learners and confidentiality of respondents.

To overcome these ethical issues the following guidelines were applied:

- Ethical clearance from the University of the Witwatersrand was requested, see Appendix D
- Permission to conduct this study was obtained from the DBE. (see Appendix C)
- Permission from the school principals to visit their schools was obtained,(see Appendix C) ,In addition participants to this study were informed of their voluntary participation and given the opportunity to decline to answer questions where they deemed it necessary .
- To ensure that the participants' identity remained anonymous and to retain confidentiality, the report conceals their names and uses pseudonyms and it is carefully written to hide the possibility of identification.

3.6 Summary

This study was exploratory in its nature; it aimed to compare the facilities management strategies implemented in ordinary secondary public schools in South Africa. It examines the status quo of school physical facilities in public schools and investigates the differences in the various public schools systems which are evidently diverse in the way they are managed due the historical landscape of the country. Data were collected using qualitative and quantitative methods. The instrument used for this purpose was semi structured interviews and questionnaires. The

questionnaire survey with the custodians of school facilities and semi-structured interviews with the school principals and representatives from the DBE were carried out and the resulting qualitative and quantitative data was used to develop recommendations for public school FM strategies.

The technique used to select the sample included a random stratified sampling method. The case study focused on the FM characteristics of former Model C and previously disadvantaged (Model B) secondary schools. The interview schedule was divided in four sections which covered the physical fabric condition, operational process methods, FM policy and strategy and finally budgets. Data collected from the interviews was analysed under these categories.

The questionnaire which was conducted with the school facilities manager / custodian of the school facilities was divided into the following topics; school background, FM structure, management of school facilities and how the facilities meet the schools current needs. These categories were used to analyse the data in a comparative case study set up.

Observations of the physical school facilities also allowed the researcher to understand and appreciate the issues faced by the two different public school systems addressed in this research

Chapter 4: Research Findings and Discussion

4 Introduction

The sample for this study involved four ordinary public schools located in the Johanneburg Central and South region. This means this research constitutes a multiple case study. Yin (2009) describes multiple case study as a relevant method for theories that are critical to test theories. Multiple case study design assists in constructing a framework in which either literal replication predicts similar results accross multiple cases or it aims at theoretical replication whereby different results are likely for theoretical reasons. Yin (2009) further points out that the type of case study depends on the purpose of the enquiry. The method adopted for this research follows the collective case study method, this is because a number of cases will be studied, the cases being the schools in order to enquire into a particular phenomenon

4.1 Gauteng Department of Education – Interview

4.1.1 Operational Process and Methods

The project manager for school facilities from the Gauteng Department of Education pointed out that generally township schools pay lower fees compared to former Model C schools. All schools are given a budget for FM which is defined as maintenance. There is a difference between section 21 and section 20 schools. Section 21 have the capacity to manage their own funds.In the Deparments Infrastructure Programme the strategy is to :

- Develop and implement a plan for the rehabilitation and maintenance of schools so as to bring an end to the era of broken windows.
- Make schools safe by erecting fencing
- Addressing overcrowding and classroom backlogs
- Develop a new standard of design for school in the province
- Work with other departments to develop and implement an integrated plan for infrastructure delivery.

The main driver for the above strategies is to bring equity to schools, but some schools have parents that are willing to assist more than other schools and this unfortunately still skews the equity

4.1.2 Facilities Management Policy & Strategy

The DBE has a guideline for spending and these guidelines are referred to as the National Norms and Standards for School Funding. The DBE representative emphasized that all schools should follow these guidelines when procuring items for the school. These standards are there to ensure that Principals do not decide for themselves how to utilize the funds. So each school should have a tender committee that assists in selecting a vendor to carry out work for the school.

The DBE officials highlighted that all public schools in South Africa should follow the basic guidelines provided by DBE to prioritize day to day emergencies related to school facilities and these are referred to as the "big five" and they are classified as follows:

- Blocked Toilets
- Burst water pipes
- Delivery of water to schools without access
- Emptying of septic tanks
- Falling ceilings

4.1.3 Budgets

All public schools receive a resource allocation and depending on the quintile ranking of the school the allocation will differ. For instance if the school has 1500 learners and it is a quintile 1, and allocation of R1550 is made per learner by the DBE the calculation will be as follows:

Allocation per learner x Number of learners in school = Total resource allocation.

R1550(allocation per learner) X 1500(number of learners) = R2,325,000.00

From the total resource allocation 12% should be reserved for the management of facilities. So for the example above the allocation should be R279,00.00.

The representatives from the DBE also emphasized that all schools that receive a resource allocation should be able to manage their budget effectively. The DBE representative also said it would be useful for this research to try and evaluate how each school effectively uses the budget for maintenance by asking questions around the number of

classroom, toilets and other facilities used to meet the core needs of the schools. These questions were captured in the questionnaires presented to the custodian of school facilities. (Please see Section 4 in Appendix B).

According to the Project Manager for School Facilities, each school should have a school development plan, which should tie up with the above mentioned strategies. Though the department does not monitor these plans for each school as the Department does not have sufficient man power.

The Gauteng DBE is in the process of developing a maintenance document .The current guideline from the DBE for maintenance budget is that each school should set aside 12% of the annual budget for maintenace. There are many factors that impact the usage of this budget allowance, and as pointed out by the project manager for school facilities. The following may impact the manner in which the funds are distributed within the schools by the school principal and the SGB.

- Loading in classrooms
- Wear and tear
- Load experience in the toilets

4.1.4 Conclusion

The interview with the DBE revelaled many consistencies with the policies and strategies outlined by the DBE regarding quintile ranking of schools, how the title section 21 or 20 is bestowed upon a school and the recommended spending of schools funds allocated by the DBE. From the interviews with the DBE officials, it became evident that issues such as budgets for school infrastructure , guidelines around prioritisation of funding is outlined in the National Norms and Standards for School Funding and the Minimum and Optimum Norms for School infrastructure. The real test comes in the implementation of these strategies by schools and how there may be differences and similarities in the application of these policies

Despite the fact that policies around funding are available, there are still gaps in the directives around policies concerning management of school facilities and maintenance as revealed during the interview that DBE is in the process of developing a maintenance plan document. Obviously, without a suitable policy framework this creates difficulties for many schools who may not be equipped to draw up a maintenance plan specific to their school.

4.2 Comparative Case Study – Inteviews

Interviews were conducted with the principals of the schools selected for this study. The questions were divided into four main categories namely:

- Physical fabric condition
- Operational process and method,
- Facilities management policy strategy
- Budgets.

These questions aimed to achieve various outcomes .

- Section 1 of the interview schedule aimed to establish the schools physical condition.
- Section 2 aimed to establish if the schools facilities meet the schools needs
- Section 3 tried to establish the SGBs interpretation of their role as outlined by SASA
- Section 4 aims to establish the school's budget allowance for FM.

Findings from the interviews with the school principals arer presented in table 10-12.

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Table 10: Do the school facilities meet the school needs

Physical Fabric Condition	**School M** - The physical structure of the school is fair and needs painting and minor repairs. Overcrowding is a problem, teachers complain about the size of the classrooms. Vandalism is one problem that the school is faced with; learners sometimes damage elements such as the paint on the walls external walls have been recently painted but already walls have scribbles on them. **School G** - The physical structure of the school is good. There is a shortage of classrooms. Infrastructure is generally in a good condition. Due to overcrowding facilities and infrastructure are over utilized. The age of the school has led to failing water supply pipes and other infrastructure. School toilets have been upgraded recently. Toilet seats often break because of learner vandalising, but the school now has prefects looking after the toilets during breaks so that the learners do not vandalise the toilets. **School T** - The physical structure of the classrooms and toilets is worn. The office is in a good condition. The school is in need of sports grounds, and a revamp on the toilets. A water pipe at the back of the school was leaking. Grass is not always trimmed as there are not sufficient resources to cut the grass. A school hall is needed. Additional classrooms are needed and a plan to respond quickly to broken windows and doors. **School R** - The physical structure of the classrooms is worn. The toilets are worn out. The offices are in a good condition and the school grounds are fair. The classrooms are not clean. The grounds need to be trimmed. Toilets need to be fixed. Facilities problems faced by the school are dysfunctional toilets, broken windows, overgrown grass on the grounds and dirty classrooms. There is no formal maintenance plan, but when the need arises for example when the grass on the sports grounds needs trimming then the then school will attend to it. The maintenance team inspects the facilities daily.

Summary: Generally the physical fabric of the two former Model C schools is in good compared to the two previously disadvantaged schools which are characterized by worn out toilets and unkempt school grounds. Overcrowding is a major issue in the two former Model C schools and this has led to many infrastructural systems being overburdened by the number of learners that exceed the initial number that the school was designed for.

Operational Process and Methods	**School M** - The school does not have a documented maintenance plan, but there are annual deep cleans scheduled each year. Building elements are inspected on an ad hoc basis. During school holidays major repair work and cleaning of classrooms is attended to. The school has 13 maintenance staff. Teachers inform the maintenance staff of any work that may require attention. Before school holidays teachers fill in a job cards and issues are addressed during school holidays. **School G** - Service requisitions are logged on a daily basis by teachers, for any dysfunctional facilities. Inspections are done on a daily basis on the external fabric. The principal and deputy do daily checks as well and walk around the school. Safety is the first priority and any school facilities that may harm learners are dealt with immediately for instance broken windows. School campus manager is fully aware of the needs of school in terms of maintenance. Principal and teachers play a supportive role in making maintenance team aware of facility management problems. Teachers are responsible for their classrooms and IT issues are dealt with by the IT team. Maintenance staff (cleaners and general workers) attends regular courses on plumbing and electrical maintenance to up skill them. **School T** - There is no formalized operational/maintenance plan. Maintenance staff cleans classrooms during school holidays. Learners clean classrooms every Friday. The school has night patrollers that walk around the school daily and they inspect the external fabric of the school building and they report to the principal any broken facilities or structural elements that may require repairing. Patrollers and maintenance staff identify facilities that require attention, and they are sorted out when funds are available. The general workers who are responsible for the maintenance are aware of the needs of the school, but checking and attending to elements such as roof, gutters and trimming of school grounds is only attended to when necessary. **School R** - The school does not have an operational/maintenance plan. Classrooms are cleaned during the school holidays by the general workers. Teachers and learners report anything that may be faulty in the classrooms and the maintenance team pick up anything that maybe faulty through their daily inspections any work that requires urgent attention is accumulated until there is an substantial amount of work and the relevant person is called to remedy the broken item. There is a teacher who is responsible for all the maintenance and manages the general workers. Facilities problems are sorted out as and when the need arises. Teachers are responsible for their own classrooms and are expected to report anything faulty to the maintenance staff.

Summary One of the former Model C schools “School G” has a maintenance plan this is evident in the structure of the school which is well kept .School M carries out maintenance on ad hoc basis, but has a plan that keeps the school well maintained. Unlike the two former previously disadvantaged schools which do not have plans and that is evident in physical

appearance of the schools which have worn out toilets. In both School T and School M facilities problems are sorted when the need arises

Table 11: FM Strategy

Policy and Strategy	**School M** -The SGB has an understanding of their role in terms of maintenance. The SGB looks after the schools grounds and buildings. SGB does random checks and makes every effort to repair, get quotes, implement and oversee the project. Daily facilities inspections are carried out by the general workers and there is a holiday cleaning programme. The role of the SGB guided by the SASA. School uses DBE to request big infrastructure projects such as additional classrooms. **School G** Facilities management is understood in terms of maintenance and the principal and campus manager understand clearly the role of maintenance within the school. The SGB are lenient in providing funding for maintenance. The SGB allows the Principal and Campus Manager to take decisions related to maintenance. The school principal highlighted that she attended a township school and facilities were not well maintained, broken doors would remain unfixed for long periods of time and compared to the school that she is currently managing there are huge differences that are noticeable. The school maintenance team works well together and they are supported by a good finance team this has helped maintain school in a good condition. **School T** There is an SGB in the school but the school has no interaction with the SGB especially when it comes to issues of maintenance. The principal handles most of the issues together with general workers The general worker interviewed highlighted that there were huge differences between former Model C schools as the general worker previously worked for a Model C School. There are no formal strategies with regards to facilities The principal takes decisions on what should be addressed, but generally facilities that require urgent attention are dealt with if funds are available. The school has a school management team which is referred to as the SMT that deals with issues related to maintenance, but there is not a lot of support from the SGB in terms of decisions related to maintenance.

Summary: The general interpretation of the SGBs role in both Model C schools is understood very well. School G's SGBs is very supportive in addressing school facilities management issues. They trust the campus manager's recommendations. School M also receives s a lot of support from the SGB. This is different in the previously disadvantaged schools in school T interaction with SGB is limited and in school R there are struggles in attaining SGB approval for repairing school facilities

Table 12: Budget allowance for facilities management in schools

Budgets	**School M** -The school keeps historic data of school maintenance the budget. The school had an actual spent for maintenance of R297, 320.00 for 2013. Since this is a fee paying school the balance required to cover for maintenance is subsidized from fees. School M has received assistance from the DBE for additional prefabricated classrooms previously. **School G** - Guidelines issued by the DBE are used. School G receives ±R183 per learner, and maintenance takes about 12% of the overall budget. The allowance is not sufficient to cover all the school's needs. Balance is subsidized by school fees. Approximate annual budget for maintenance is R1 million. The school has received assistance for prefabricated buildings. Subsequent requests for damaged walkway concrete and damaged roof have been logged, requisition was logged in 2006 and nothing has happened. **School T** - Since this is a no fee paying school, the budget for maintenance is per the guideline issued by the DBE. This is 12 % of the annual allowance per learner issued by the DBE. Though this is not sufficient for the maintenance needs of the school. Requests have been put through to the DBE to have the cracking wall fixed; the school still awaits the DBE. **School R** - The budget is managed by the SGB and the principal. Since this is a no fee paying school, the budget for maintenance is per the guideline issued by the DBE. This is 12 % of the annual allowance per learner issued by the DBE.

Summary: Both former Model C schools keep records of their annual maintenance budget spend. School G attributed this to a good finance team. All schools complained about the annual maintenance budget from the DBE not being sufficient.

Conclusion

The interviews revealed that all the schools are responsible for the management of facilities. The degree of awareness regarding the schools maintenance needs was very high amongst all the participants. Principals in all the schools play a vital role in leading the maintenance of the schools,

4.3 Comparative Case Study - Questionnaires

The school facilities discussed in this case study are school buildings primarily used for secondary school learning. They are located in the Johannesburg Central and South Regions. For purposes of this research the schools' real identities were concealed as some schools were reluctant to reveal their identities. The findings included the physical observation of the schools by the researcher and these will all be addressed in the section. The analyses of the data are separated into five main categories that were also split into the same manner in the questionnaires. (See appendix B). The categories were as follows:

- Section 1 – School background
- Section 2 – Facilities management structure
- Section 3 – Management of school facilities
- Section 4 – Meeting current core school needs
- Section 5 – Strategic facilities management

4.3.1 Background of the schools

School M

This school is situated in the Johannesburg Central District in Mondeor.The school is ranked as a quintile 5 school with regards to the Gauteng Department of Education school list and it is a section 21 school. There are 1669 learners and it is classified as a mega school. School M was previously referred to as House of Assembly (HOA) which is also referred to as a former "Model C" school..

School G

This school is situated in the Johannesburg Central District in Glenvista. The school is ranked as a quintile 5 school as per the Gauteng Department of Education school list. It has 1455 learners and is classified as a mega school.School G was previously referred to as House of Assembly (HOA), which is also referred to as a former "Model C" school.

School T

This school is situated in the Johannesburg Central District in Protea North, Soweto. The school is ranked as a quintile 5 school with regards to the Gauteng Department of Education EMIS. It is also a Section 21 school, and has 1145 learners registered in the school and is classified as a mega school. School T was previously referred to as Department of Education and Training Institution, this school can be classified as a previously disadavantaged schools.

School R

This school is situated in the Johannesburg Central District in Protea North, Soweto. The school is ranked as a quintile 5 school as per the Gauteng Department of Education EMIS. It is also a Section 21 school, and has 1807 learners registered in the school and is classified as a mega school. School R was previously referred to as Department of Education and Training Institution, this school can be classified as a previously disadavantaged school.

4.4 Schools Background

This section of the questionnaire attempted to establish the background of the schools and the biographical information of the schools. Questions were targeted mostly at the school principals and/or a member of the governing body.

4.4.1 Classification of Schools

All the schools interviewed were section 21 public schools and they were ranked as quintile 5 schools. This was a direct result of the selection process chosen for this research as explained in the research methodology.

4.4.2 Age of schools

School T which is a previously disadvantaged school is the oldest amongst all the school surveyed at 34 years, followed by school G at 26 years and then school M at 25 years. The youngest amongst the sample of schools is School M at 23 years, which is a former Model C school.

4.4.3 Average school fees per year

All the schools used in this research are ranked as quintile 5. School G and School M, which are former model c schools, charge fees. School G charges the highest at R22000 per annum, followed by School M at R19000 per annum. Generally the ranking of the school determines their non-fee status and normally quintile 5 schools charge fees. In this case the two previously disadvantaged schools (School R and School T) are non-fee schools meaning they receive the greatest per learner allocation and therefore fee paying schools in this study receive less funding per learner as it is assumed that these schools are better able to raise funds, because there are located in a wealthier community.

4.4.4 Responsibility of school maintenance budget.

From Table 13 it is clear that in the two former "Model C" schools, the SGB plays an active role in developing the budget for the school facilities. In school R and school T there is a high a reluctance of parents in these schools to join SGBs and as a result there is limited input in developing the school budget. In school R there is SGB involvement in managing the school maintenance budget, but the SGB is reluctant to spend on school facilities.

Table 13: Responsibility of School Maintenance Budget

	Former Model C	Former Model C	Former DET	Former DET
	School M	School G	School T	School R
Principal			Principal	Principal
School Governing Body	SGB	SGB		SGB
Department of Basic Education			DBE	DBE
External Consulting Company				

4.4.5 School maintenance budget

The graph in Figure 3 shows that School G has the highest maintenance budget at R1, 000,000.00 amongst the four schools, followed by School M at 70% lower than School G. School R and School T, have the lowest maintenance budgets which are dependent on the allocation given by the DBE. These are sufficient to cover just the necessary facilities items for the school. The maintenance budget for School R and School T is 12% of the overall resource allocation received from the DBE. School M had accessible records of the maintenance budget spent for the past 3 years.

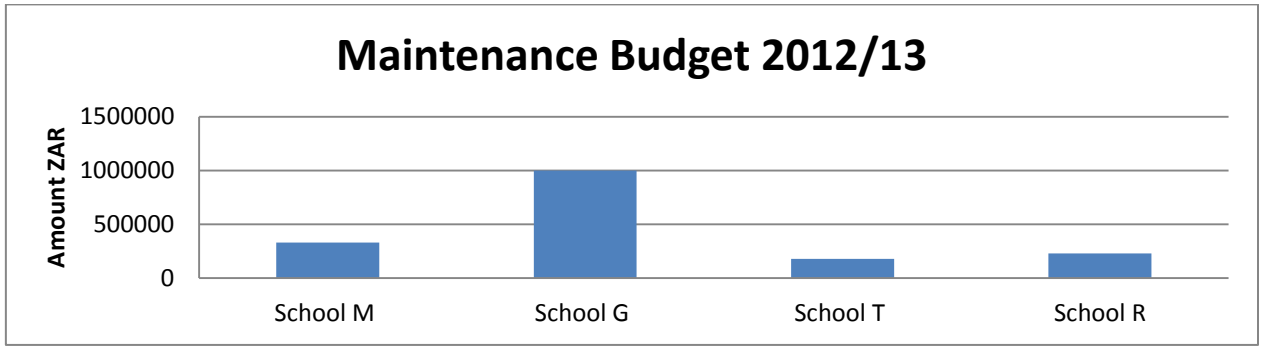


Figure 3: School maintenance budget

4.4.6 Discussion

The four schools are classified as “mega” schools meaning they have an enrolment of between 931 and 2500, and are ranked as quintile 5 and fall into the Section 21 category. All schools met the boundaries as set in the selection criteria for this research, and this set the delimitations. School T was the oldest amongst all the schools and as discovered in the literature, aging school buildings often create barriers such as poor air quality, unconducive thermal comfort and poor acoustical quality and compromised quality to natural lighting that can impede effective teaching and learning, if not maintained properly according to Cash and Twiford (2010). This was evident in the physical appearance of School T. Though School M was the youngest in the group of schools but the school looked fairly worn out and was in need of a few coats of paint and repairs, as pointed by the custodian of the school facilities that overcrowding plays a role in the wear and tear of the school. It was strange that school T and school R we ranked quintile 5 (section 21) but they have also been declared a non-fee paying school, this obviously skewed the allocation of resources from government perspective.

During the physical observation of the school which included a walk around the school with the custodian of school facilities in all the schools. The former Model C schools were both noticeably more resourced than their counterparts in the previously disadvantaged schools (former DET). The former Model C schools had more sporting grounds which were well maintained, compared to the former DET schools in the townships which had fewer sports grounds which were poorly maintained.

4.5 Facilities Management Structure

This section of the questionnaire explored the FM structure of the school or the department responsible for maintaining school facilities. Questions were targeted mostly at the custodian of school facilities.

4.5.1 Facilities management department

All four of the schools FM custodians indicated that the school had a facilities management department.

4.5.2 Role of FM department in the school

Both School T and School R, which are previously disadvantaged schools only dealt with maintenance issues which are cleaning classrooms, identifying facilities that require repairing.

The facilities management department in both former Model C schools dealt with maintenance and other issues. The school facilities custodian managed the school vehicles, the maintenance staff, external company that deep clean the toilets, the security guards and external garden service company.

4.5.3 Facilities management department

School M has employed 13 maintenance staff members who are responsible for cleaning the school grounds, classrooms, school buildings. They are referred to as grounds men. The custodian of facilities at this school indicated that they are responsible for overseeing and coordinating the daily activities of these grounds men.

School G has between 6-10 general assistants who are responsible for cleaning the classrooms, repairing broken windows, doors, and any other handy work. They have been taught skills such as plumbing, electrical, brickwork and welding. They have been taught by the campus manager who is a qualified electrician by trade. The general workers have also attended courses offered by the department of public works to empower them with various artisan skills. So the majority of the work is carried out by the school general workers. One such example, as pointed out by the campus manager, was the parking area paving which was built by the school general workers. The campus manager also initiates many security measures within the school such as electric gates.

School T has 4 general workers who are responsible for cleaning the school grounds and notifying the principal of any items that may require repairing such as broken window, doors, walls and other structural elements in the school.

School R has 5 maintenance staff that are responsible for cleaning the school grounds, classrooms, school buildings. They are referred to as general workers. The custodian of facilities at this school is a school teacher, and the general workers report to the school teacher.

4.5.4 The organisational structure of each schools facilities management functions.

There is a considerable difference in scale of functional operations between the former Model C schools and the previously disadvantaged schools. In the two from Model C schools there is a designated role for managing school facilities and in School G it is referred to as a campus manager and in School M the role is referred to as the head grounds man. These two roles relieve the principals from focusing too much attention on maintenance related issues and this allows the principal to focus on the core function of the school which is to educate learners. School T and

School R do not have a specialized role for managing school facilities and the principals are involved in the day to day operational maintenance issues.

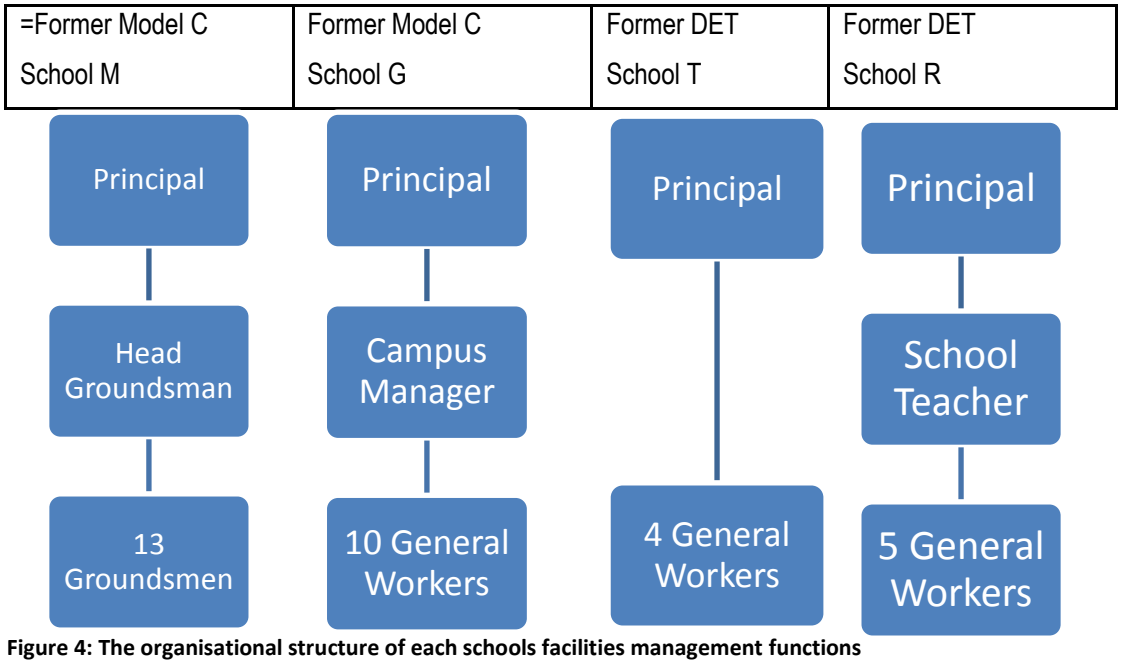


Figure 4: The organisational structure of each schools facilities management functions

4.5.5 Number of security staff

School G, School M, and School R utilize an external security company which has one security guard per shift. School T uses volunteers from the community for security purposes.

School M also utilizes the services of an armed response guard company in the event of safety emergencies.

School G places a strong emphasizes on security, there are surveillance cameras around the school and they use a biometric access for the learners.

School T also has night patrollers who serve as security and also inspect the school facilities for any broken elements such as windows, doors, fences and walls.

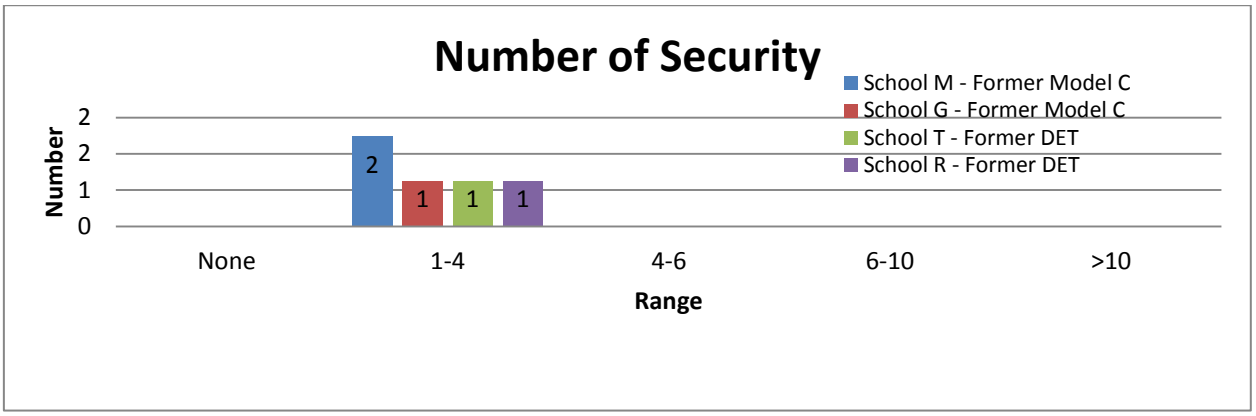


Figure 5: Number of security staff

4.5.6 Nature of school cleaning service

School M utilizes the service of their in-house staff members for cleaning during the year. The team is made up of 13 grounds men, each member is responsible for a certain area of the school. Bi- annually, the school uses an external company for the deep cleaning of the school facilities.

School G uses their internal staff for cleaning the school.

School T uses their own general workers for cleaning classroom, toilets and school grounds. There are 4 general workers in the school. School T also gets assistance from learners for cleaning the classrooms once a week.

School R makes use of the 5 general workers for cleaning school. The general workers clean the classrooms only during school holidays.

4.6 Summary of Facilities Management Structure

School M

- There is an office that deals with facilites.
- Facilities department does not only deal with maintenance issues only but also handles the school vehicles .
- All the groundmen report to the head groundsman.
- The cleaning services are in-house, though the deep cleaning of the toilets is outsourced , twice a year. The gardening services are handled by one in-house permanent staff member while the bulk of the garden services are outsourced to an external company.
- Small repairs are carried out in-house and major repairs are outsourced.

School G

- There is an office that deals with facilites.
- Facilities department does not only deal with maintenance issues only, but also security.
- All the groundmen report to the campus manager.
- The cleaning services are in-house. All the cleaning is carried out by groundsmen. Only the cutting of the grass is outsourced to a company that comes in 3 times a week
- All repairs are carried out in house.
- All groundmen have undergone training for certain trades, ranging from building work, to plumbing.

School T

- There is a team of general workers that deals with facilites maintenance
- The general workers only handle maintenance issues
- All general workers report to the principal
- The cleaning services are in-house. All the cleaning is carried out by the general workers.
- Most school facilities repairs are outsourced.

School R

- There is a team of general workers that deals with facilites maintenance
- The general workers only handle maintenance issues
- General workers report to a school teacher

- The cleaning services are in-house. All the cleaning is carried out by the general workers.
- Most school facilities repairs are outsourced. .

4.7 Discussion

All the schools have a department that deals with maintenance, though not entirely referred to as a FM department. The two former Model C schools do not only deal with maintenance issues, but also handle various other supporting services such as their vehicles and security. All schools placed a high emphasis on security.Both the previously disadvantaged schools utilized external services for minor and major repairs. School M which is a former Model C school, only outsources major repairs. School G uses the inhouse resources to effect majority of the minor and major repairs.

School G which is a former Model C school had more robust personal development programme for their grounds men as they continuously tried to improve their skill related to their daily tasks.

4.8 Management of School Facilities

The objective of this section was to ascertain the physical state of the school facilities.

4.8.1 School maintenance plan

The custodians of the school facilities were asked if the school has a school maintenance plan. The respondents from School G and School T indicated that their school had a maintenance plan. Though School T indicated it was not a formal plan but it is understood by the general worker as what needs to be done.

School R and School M indicated that they did not have a plan. Therefore routine maintenance of these school facilities is when it appears necessary.

4.8.2 Responsibility of facilities inspections

Routine inspections are carried out in all the schools in order to identify facilities that may need attention.

School M indicated that the grounds men carry out daily inspections and they notify the head ground man, who will then liaise with the principal if the repair work required is major, to see if there a budget for this sort of work.

School G carries out daily inspections and these are carried out by the campus manager and the principal and the deputy principal carry out ad hoc inspections and they report any problems to the campus manager.

School T, indicated that they have patrollers who walk around the school at night and they inspect the school facilities for any damage and these are reported to the principal in the morning. The general workers who work during the day also inspect the facilities and report any issue to the principal.

School M, places the responsibility of inspecting the school facilities on the general workers who then identify problems and then report them to the teacher responsible for managing the maintenance team.

Table 14: Responsibility of Carrying out Facilities inspections

School M	School G	School T	School R
Grounds men	Campus Manager , Principal and Deputy	Patrollers and General Workers	General Workers

4.8.3 Frequency of facilities inspections

All schools carried out daily inspections. The only difference that was evident was the manner in which the outcome of the inspections was actioned. The turnaround time for fixing broken building elements in School T and School R was higher as they generally wait for main for the work to be a lot before the carry out repairs, due to limited funds. School G and School M have a lower turnaround time.

4.8.4 Elements checked during inspection

From the daily inspections carried out schools basically checked similar elements, but School G added a couple of items that they check on a daily basis which the other schools do not check. School G is the only school that checks the school roof on a daily basis.

School R indicated that the roofs are too high up and the school does not have ladders to check, but roofs are generally checked if there is a leak.

Table 15: Elements checked during inspection

Element Description	School M	School G	School T	School R
Roofs		x		
Framing	×		×	×
Floors	×	×	×	×
Internal Walls	×	×	×	×
Plumbing	×	×	×	×
HVAC	×	×		
Electric Power	×	×	×	×
Electric Lighting	×	×	×	×
Other:				
Balustrades and handrails		x		
Storm water drains		×		
Sewage		×		
Ceilings		×		
Security gates		×		
Fencing		×		

4.8.5 Custodian off asset register

All schools have an asset register which keeps record of all the school assets. The register is kept by different people in different schools as shown in Table 16.

Table 16: Custodians of asset register

	School M - Former Model C	School G - Former Model C	School T - Former DET	School R - Former DET
Lab Assistant	**X**			
Admin Office		**X**		
General Worker				
Principal			**X**	**X**

4.9 Summary Management of School Facilities

School M

- The school does not have a formalised maintenance plan.
- Though the school has a team of groundsmen who ultimately report to the principal, there is not a clear organisational chart that defines roles and responsibilities
- All the groundmens carry out maintenance inspections.
- The inspections are done on a daily basis
- Facilities normally inspected are shown in Table 15, the only items that are not checked is the roof structure.
- The school has an asset register which is kept by the lab assistant.

School G

- The school has a maintenance plan.
- The school has an organisational structure that defines the roles and responsibilites of the custodians of school facilities
- Responsibility of the facilities lies with the campus manager, but principal walks around the school with the deputy as well to inspect the school facilities.
- The inspections are done on a daily basis

- The facilities that are normally inspected are shown in Table 15 School G checks additonal items as well.
- School G has an asset register, which is kept by the admin office

School T

- The school does not have a maintenance plan.
- The school does not have an organisational structure that defines the roles and responsibilites of the custodians of school facilities
- Responsibility of the facilities lies with the night patrollers and the general workes.
- The inspections are done on a daily basis
- The facilities that are normally inspected are shown in Table 15, roofs are excluded from the checks.
- The school keeps an asset register and it is kept by the school principal.

School R

- The school does not have a maintenance plan.
- The school does not have an organisational structure that defines the roles and responsibilites of the custodians of school facilities
- Responsibility of the facilities lies with general workes.
- The inspections are done on a daily basis
- The facilities that are normally inspected are shown in Table 15, roofs are excluded from the checks.
- . The school keeps an asset register and it is kept by the school principal.

4.10 Discussion

Only one school has a maintenance plan which is a former Model C school. The rest of the schools do not have a maintenance plan meaning the lack of a predetermined inspection plan does not allow school M, T and R to plan on their asset condition. This could result in high cost due to reactive work. All four schools carry out daily inspections. The highlight of this section is that since FM is a collective decision in relation to facilities, having the school principal and the deputy also conducting adhoc inspections allow the school to act proactively on facilities that may require attention as the decision makers are involved. Asset registers are kept by all schools, which is a requirement by the DBE.

The basic safety as outlined in the DBE's guidelines is met by all schools which outlines the factors present in school environments which may cause harm to learners and educators and hamper carrying out the core functions of a

school. Even though School M and school G have more resources than the two former previously disadvantaged schools, all schools met the basic safety outline.

4.11 Meeting current core school needs

This section aims to establish if the facilities meets the schools needs

4.11.1 Condition of school

Respondents, who are custodians of the school facilities, were requested to comment on the general condition of the school.. School G, from the facilities manager point of view, is maintained well and the condition is good. The head grounds man for School M indicated that school M was in a fair condition. The general worker from school T emphasized that there are a lot of building elements that require urgent attention, but because funds were limited they could not always maintain them routinely, and hence the general worker from School T rated the condition for the school as poor. School R is also rated as poor because there were a lot of elements that needed attention such as the male toilets.

4.11.2 Number of classrooms

School M has the highest number of classrooms at 72 with an approximate of 1700 learners in the school.

School G has the second highest number of classrooms at 50 classrooms and the school has 1368 learners.

School T has the smallest number of classroom at 29 classrooms and the school has 1169 learners.

School R has 41 classrooms with 1807 learners enrolled at the school.

4.11.3 Maintenance plan for cleaning classrooms

The two former Model c schools have a maintenance plan for cleaning classrooms, the two previously disadvantaged schools do not have

4.11.4 Frequency of cleaning classrooms

In School M the classrooms are cleaned daily by the grounds men. The class rooms are thoroughly cleaned during school holidays. This includes deep cleaning by an external company. School G's classrooms are cleaned 2 times a week by the school maintenance team. Thorough cleaning is also done during school holidays.

In School T, the general workers only clean the classrooms during school holidays. For the rest of the year, the learners clean the classrooms every Friday.

School R does not carry out any cleaning during the week, the learners only sweep the classrooms during the week, but this does not always happen because the learners are sometimes reluctant to sweep the classrooms. So the only major cleaning that happens is during the school holidays, and this was very visible during the observation of the school the classroom floors were dusty and the general appearance of the classroom was not pleasing.

4.11.5 Communication process to notify maintenance team about work

The manner, in which the maintenance team is notified about work that requires repairs, differs from school to school as presented in Table 17

Table 17 :Communication process to notify maintenance team about work

Method	School M - Former Model C	School G - Former Model C	School T - Former DET	School R - Former DET
Job Card	x			
Repair Requisition		x		
Patrollers verbal report			x	
Maintenance team				x

The head grounds man from School M indicated that teachers normally write what is called a job card before school holidays and it is addressed during school holidays by the maintenance team.

School G has a more proactive system, in which teachers or learners fill out a repair requisition if there is anything wrong they might have noticed and this is dropped off in the campus manager's pigeon hole on a daily basis and these issues get addressed on a daily basis.

School T relies on the night patrollers who walk around at night who guard the school premises, but they also note any facilities that may require repairs. These are then reported to the principal and the general workers in the morning. The respondent also pointed out that any report for repairs i.e. a broken window the principal will note this down and wait for a number of broken windows before attending to the problem. The general worker interviewed pointed out that a lot of times the reason for this is the lack of funds

In school R, the general workers walk around on daily basis to identify building elements that may require attention. These are then reported to the teacher responsible for the maintenance team. The process would then be similar to School T in that building element requiring repairs will only be fixed once the funds are available.

4.11.6 Turnaround time for facilities repairs

The turnaround time to sort out facilities problems for School M is 1 day for smaller items and bigger item such as broken doors can take anything from 2 to 5 days. Then major items are dealt with during school holidays

School G's turnaround time is 1 day. The campus manager pointed out that it is quick to act on all repair requests because all the maintenance staff have been taught various trades ranging from glazing, plumbing, electrical work, bricklaying and minor handy work. Hence most of the work is fixed by the school grounds men within a day or two.

In School T the general worker questioned indicated that the turnaround depends entirely on the funding available at the time, but generally the school waits for many broken items to accumulate. Normally broken windows are fixed before the winter season.

The general worker at school R responded by saying that generally the turnaround time is greater than 30 days because the general workers wait for many similar items to be broken before they can resolve the problem.

4.11.7 Toilet system

All the schools used for this sample indicated that they use a system that flushes to the sewer, as shown in Table 18.

Table 18: School toilet system

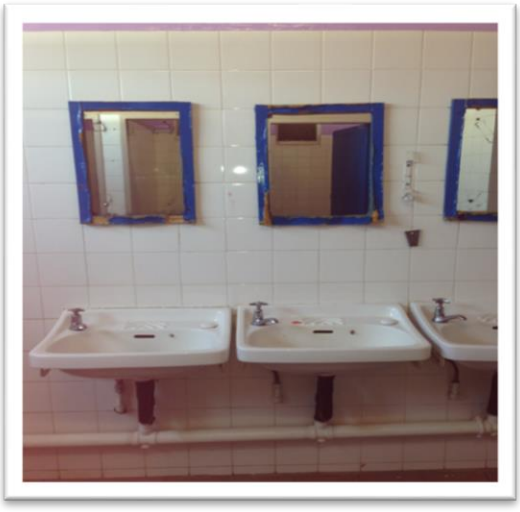
System	School M - Former Model C	School G - Former Model C	School T - Former DET	School R - Former DET
Flush system to sewer	x	x	x	x
Flush system to septic tank				
Chemical toilet				
Pit latrine				
Bucket system				

4.11.8 Frequency of cleaning toilets

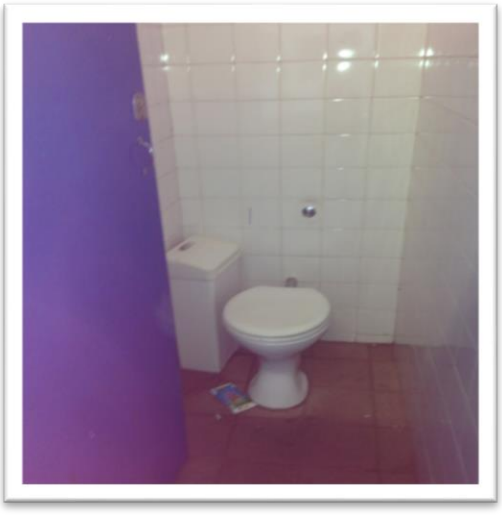
The toilets in school M are cleaned on a daily basis though they are old.

The picture below shows the state of the toilets of school M.

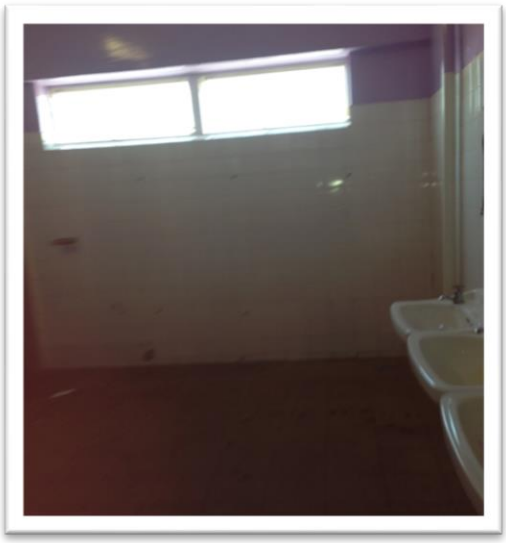
Picture 1: Toilet at School M (Former Model C)



Picture 2: Toilet at School M (Former Model C) 1

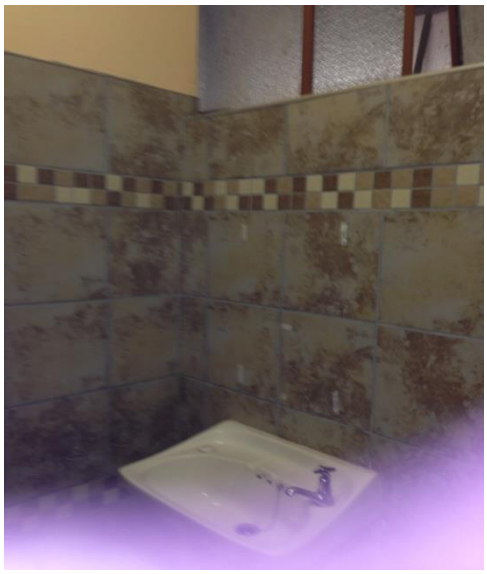


Picture 3: Toilet at School M (Former Model C) 2



The general workers at school G clean the toilets on a daily basis. The toilets have been recently renovated, and it is a project that the school raised funds for 3 years before they could implement. The school takes great pride in their new toilets and have a member of the Representative Learner Council (RCL) during breaks to ensure no vandalism is caused to the toilets. The pictures below show the state of the toilets in school G.

Picture 4: Toilet at School G (Former Model C)



Picture 5: Toilet at School G (Former Model C) 1

The general workers at School T clean the toilets once a week but the general worker questioned indicated that the toilets were not in a good condition.

School R cleaned their toilets weekly, but the boys urinals were not working at the time of the school visit. The general worker highlighted that it had been some time since they had been working. The pictures below show the state of the toilets in school.

Picture 6: Toilet at School R (Former DET) 1

Picture 7: Toilet at School R (Former DET) 2

4.11.9 State of maintenance

The general condition of the schools varied, as the respondents ranked the manner in which school facilities are maintained at different levels. It was also easy for the researcher to confirm this because of the visual observation. School M and School G indicated that the school facilities are maintained well all the time and this was visible in the physical fabric of the school.

The general workers of school T and school R had a different view regarding the status of the school maintenance, they felt the school facilities were maintained well sometimes and the main reason they cited was insufficient funding. This was visible in the state of the toilets and other structures observed.

4.11.10 Type of school grounds available

There is a huge variance in the types of school grounds available at the previously disadvantaged schools and former Model C schools despite the fact that all the schools are categorised as quintile 5.Table 19 clearly identifies the types of facilities available at each school.

The general worker of school T indicated that the school could do with more sports grounds as currently they have an open field which has no marking and it is difficult to use for any sporting code as the grass is overgrown and the school does not have the facilities to trim it down.

School R has more sporting grounds than School T, but the netball court had cracks on the plastered surface and the boundary of the netball court is surrounded by overgrown grass.

Table 19: Type of school grounds available.

Type	School M - Former Model C	School G - Former Model C	School T - Former DET	School R - Former DET
Basic Field	x	x	x	x
Soccer Field	×	x		x
Netball courts	×	×		x
Cricket grounds	×	×		
Multipurpose sports grounds	×	×		

4.11.11 Custodians of schools grounds

As presents in Table 20 School M uses the services of external garden company to maintain the school grounds and they have one dedicated member of the grounds men who is full time on the grounds.

School G also utilizes an external service provider for cutting of the fields and the grounds men to maintain the fields.

School T uses the general workers for clearing of the grounds, but because the school does not have sufficient resources such as a lawn mower they are unable to trim the fields all the time.

School R uses the services of the general workers to cut the grass on the fields.

Table 20: Custodians of school grounds.

Responsibility	School M - Former Model C	School G - Former Model C	School T - Former DET	School R - Former DET
Grounds men	X	x	x	x
External Company	X	×		
Community				
Parents				

4.11.12 Frequency of cutting grass

School M uses the services of an external service provider three times a week.

School G maintains the ground more often than all the other schools sampled in the study. This was again as a direct result of the in-house grounds men being able to do most of the work as well and with the assistance of an external service provider.

School T the grass at this school is cut when it is necessary, as currently the school does not have a lawn mower.

School R has more sporting grounds than school T, but the frequencly that they maintained their school grounds was similar to school T. The general worker interviewed, highlighted that generally the grass would be cut after the rainy season.

4.11.13 School grounds maintenance plan

Only school M and school G had maintenance plan to maintaining school grounds. School T and school R only carried out this service when it became necessary. For instance in school T, during the researchers visit there were men clearing the grounds and the general worker indicated these men were called upon to clear the grounds as the school would have visitors from the district.

4.11.14 Process of removing/ repairing high risk facilities

As presented in Table 21, School M uses job cards that are normally filled in by the teachers notifying the grounds men about facilities that may put learners at risk.

The grounds men at school G carry out daily inspections to identify facilities that may cause harm to the learners.

School T only checks facilities that may cause harm to the learners when necessary. The general worker indicated that sometimes it becomes pointless identifying these elements because school funds were limited, and even though certain major hazards have been identified and reported to the DBE sometimes the request takes long.

The general worker from School R indicated that the school and the maintenance team were in the process of devising a plan.

Table 21: Is there a process for removing / repairing damage that may put learners at risk?

School	Yes	No
School M - Former Model C	X	
School G - Former Model C	X	
School T - Former DET		X
School R - Former DET		X

4.11.15 Frequency of cleaning gutters and storm water drains

School M clear gutters and drains annually.

Amongst all the schools sampled, School G cleared the gutters and drains the most. The campus manager indicated that this is done on a monthly basis.

School T and school R's response were similar in that they both do not carry gutter checks. School T's general worker said that the reason for not clearing the gutter was because the gutters were too high up and the school did not have ladders.

4.11.16 Basic roof checks

Similar to the clearing of the gutters, the results were similar for basic roof checks. School M and G both carry out regular roof inspections to ensure that the roof will not be blown away

School T and school R carry out roof checks when the need arises

Table 22: Are basic roof checks done

School	Yes	No
School M - Former Model C	x	
School G - Former Model C	x	
School T - Former DET		x
School R - Former DET		x

4.11.17 Frequency of repainting metal work

The frequency of repainting metalwork is not done often amongst the four schools, except for school G which paints metalwork more regularly. All the other schools indicated that metal work is painted when the need arises.

4.11.18 School fence or boundary wall

As revealed in Table 23, all the schools had a boundary wall or fence, this indicated the importance placed on safety.

Table 23: School fence/boundary wall.

School	Yes	No
School M - Former Model C	X	
School G - Former Model C	X	
School T - Former DET	X	
School R - Former DET	X	

4.11.19 Condition of boundary wall/ fence

All the schools had a boundary walls or fences that were in good condition except for school T. The general worker from school T highlighted that the fence located at the back of the school had a hole in it.

4.12 Summary meeting current core school needs

School M

- The general state of the school buildings is good.
- There is a robust cleaning programme during school holidays, and classroomns are cleaned 3 times a week. The school does not have a master maintenance plan, but it has a plan for cleaning classrooms and toilets.
- A system of jobs cards is in place for maintenance requests.
- Turn around time for fixing facilites is quick atabout 1-2 days for small items like brioken windows and about 5 days for major repairs such as broken doors, civil repairs and paving.
- Toilets are fairly clean, but require a revamp.
- The school has numerous sports grounds and uses an external company to maintain them

School G

- The general state of the school buildings is excellent.
- There is a robust cleaning programme during school holidays, and classes are cleaned 2 times a week.
- The school has a master maintenance plan for classroom and sports grounds.
- A system of jobs cards is in place to attend to maintenance requests
- Turn around time for fixing facilites is at about 1-2 days for all services, the reason for the short turnaround time, is because all repair are effected internally by school's general workers.
- Toilets are very clean, they have been recently renovated.
- The school has numerous sports grounds and uses an external company to maintain them.
- The security is excellent as the school has a biometric access system, and survellaice cameras.
- Annual inspectiions are undertaken for roofs and gutters.

School T

- The general state of the school buildings is fair.
- There is a cleaning programme during school holidays and classes are cleaned on a weekly basis by the school learners.
- The school does not have a master maintenance plan for classrooms, sports grounds and the school fields are cleaned when necesary.
- Night patrollers inform the principal of faulty facilities.
- Turn around time for fixing facilites is very long at more than 30 days as this is depedant on the availability of funds.

- Toilets are worn out and require a revamp.
- The school has one sports field and and it is maintained by the general workers
- The security is fair.
- Annual inspectiions for roofs and gutters are only carried out when the need arises.

School R

- The general state of the school buildings is fair, but the classrooms and toilets are worn out and not as clean in comparison to all the other schools sampled.
- There is a cleaning programme during school holidays and classes are cleaned during school holidays by the general workers
- The school does not have a master maintenance plan for classroom and sports grounds, the school fields are cleaned when necesary.
- General workers inform the principal of faulty facilities.
- Turn around time for fixing facilites is atmore than 30 days as this is depedant on the availability of funds.
- Toilets are worn out and require repairing and regular cleaning
- The school has one sports field and and it is maintained by the general workers
- The security is fair.
- Inspections of roofs and gutters are only carried out when the need arises.

4.13 Discussion

This section revealed the vast differences in former Model C schools and former DET(previously disadvantaged) .School G has more strategies and processes in maintaining the school facilities. School M is also a former Model C there were some gaps in the processes and it is visible in the physical apperance of the school toilets as presented earlier, still by farthe school facilities are better managed than School T and School R. The general apperance of School T and School M resonated with the maintenance plans that the schools have in place.Maintenance requirements such as broken windows and broken doors have a high turn around time,although regular inspections were carried out on basic building elements, the outcome of the inspection resulted in different methods for the two different school systems. Actions were taken immediately in former Model C schools and it took longer to sort out the problem in previously disadvantaged schools due to available funds being limited.

4.14 Schools strategic facilities management and facilities performance measurement

This section aims to establish the leadership teams' (SGB, principal, facilities management team) understanding of their role in ensuring that the school facilities are managed efficiently as outlined by the SASA Another aim was to determine if the school engages other similar schools to identify best practice and how they ensure that the schools uses best practice.

4.14.1 SGBs interpretation of SASA

School M and School G's SGB have an excellent understanding of their role with regards to maintenance. Unlike School T and school R where the SGB has limited knowledge as to what is required of them.

4.14.2 SGBs understanding of their role with regards to maintenance

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It is noted that SGB plays a significant role in the running of schools. In partnership with the Government, they share the responsibility of developing and maintaining schools at a local level. Therefore the limited understanding of the SGB in terms of this role in school T and school R will impact the manner in which the facilities are managed.

4.14.3 Repairs affected through the Provincial Department of Basic Education

All schools have, at some point, requested major maintenance work from the Provincial DBE. All the schools have had prefabricated classrooms installed in the schools to overcome overcrowded classrooms. Though the general feeling amongst all four schools was that a lot of the requests put through the Provincial DBE take long to become a reality and that generally frustrates the schools.

4.14.4 Benchmarking/Best Practice

This is only done in School G and as a result many initiatives have come out of visiting other schools to get ideas on how to best overcome FM challenges and implement new ideas. The campus manager at School G regularly visits other school in the area to compare ideas and share knowledge. Some of the initiatives that have been implemented in the school are the biometric access system, which is used for access for school learners. This has

allowed teachers to save time by not marking a school register. Another initiative that has been implemented are surveillance cameras which was another idea that came from a visit by the campus manager at another school

School M, School T and School R do not carry out benchmarking/best practice exercises, despite School T and School R being in the same area and about 1km from each other and that they face similar challenges.

4.15 Summary schools strategic facilities management

School M

- The SGBs understading of their role as outlined by SASA is very good. As they support the school in assessing quotes for maintenance work that is required.
- School M is aware of the Provincial DBE's 'responsibility regarding major repairs hence they have used this option to request additional classrooms which were granted by the DBE.
- Benchmarking and best practice exercises are not carried out.

School G

- The SGBs understanding of their role as outlined by SASA is very good. They support the school in initiatives that school campus manager suggest, and as they trust the campus managers decision as who has been a member of the SGB for a considerable amount of time.
- School G is aware of the Provincial DBE's responsibility regarding major repairs and hence they have used this option to request additional classrooms which were granted by the DBE. Further to that, they have been two requests lodged to the DBE for a roof that is not sturdy and a concrete finish to a walkway. These were lodged with the Government in 2006 and the school is still waiting.
- Benchmarking and best practice exercises are carried out as often as possible to assess how are other effeciently run school are perfoming. As a result of that,the school campus manager has formed fruitful relationships with school facilities managers from other schools.

School T

- The SGBs understading of their role as outlined by SASA is fair. As the school does not receive all the support with regards to intiatives . A lot of the decisions regarding maintenance are expected to be taken by the principal.
- School T is aware of the Provincial DBE's responsibility regarding major repairs hence they have used this option to request additional classrooms which were granted by the DBE, and further to that there has been a request to the DBE for a wall that is cracking and could potentially be a hazard and the school is still waiting.

School R

- School R has a School Management Team(SMT) and their understading of their role as outlined by SASA is poor. As the school does not receive all the support with regards maintenance issues, there is a lot of reluctance amongst the SMT members to spend money on maintenance.
- School R is aware of the Provincial Department of Basic Educations' responsibility regarding major maintenance work and hence they have used this option to request additional classrooms which were granted by the DBE.
- Benchmarking and best practice exercises are not carried out

4.16 Discussion

From the comparisons above it is evident that a lot of the successes in efficiently managed school facilities lie with the SGB who play an important role in driving the school strategies in terms of maintenance. This was revealed in School M and School G SGB's understanding of the SASA guidelines on maintenance. This allowed the SGB to support the schools in managing facilities effectively. On the other end, the limited understanding of the SGB/SMT from School T and School R on their role with regards to maintenance also plays a role in the maintenance of the school and it was evident in the poorly managed school facilities.

Chapter 5: Conclusion and Recommendations

5 Introduction

This research attempted to answer research questions which emanated from a preliminary literature review, which brought to light existing problems around school facilities and how they are managed. This gave rise to research questions that this study aimed to address.

5.1 Conclusion

The aim was to establish effective FM strategies for physical school facilities maintenance by comparing deemed effective strategies in former Model C versus deemed ineffective strategies in previously disadvantaged South African ordinary public secondary schools. The analysis of data collected from interviews and questionnaires revealed that there were similarities and also differences in the strategies employed in the management of facilities in public schools. There were subtle similarities in the frequency of daily inspections carried out by the schools to identify facilities that required repairing and maintenance. The differences were vast especially in the routine maintenance procedures that included the classroom cleaning plans. School M and School G which are both former Model C schools, have a robust classroom cleaning plan, which allows classrooms to be cleaned 1-2 times a week and deep cleaning to take place during school holidays. This was visible in the way classrooms looked during the physical observation on site.

School T has an informal cleaning plan which is moderate compared to the two former Model C schools, classrooms are cleaned by the general workers during the school holidays and during the term learners are requested to clean the classrooms every Friday. This has aided the class rooms to look considerably cleaner than School R, in which on the contrary the general workers only clean the classrooms during school holidays. This is clearly visible in the state of the classrooms which were filled with dirt and dust on the floors.

There was a similar trend linked to routine maintenance and cleaning for of sports grounds, and the toilets. The frequency of maintaining these two elements was more in the two former Model C schools especially in School G and less frequent in the two township schools. They were also variances in the manner the schools dealt with emergency repairs. Emergency repairs that may be required because of the danger they pose to health and life of the occupants are prioritized in School M and School G and they are picked up early because of the job card and repair requisition process in these schools. In School T and School R items which were categorized as emergency

repairs were dealt with as and when funds became available, alternatively requests would be logged with the DBE, but sometimes the process could take long as highlighted by most principals. There are still gaps in the way the government has given schools direction to manage and or maintain school facilities.

The second objective was to determine the DBE's guidelines to maintaining and managing schools facilities. The policies around managing school facilities are covered in the National Norms and Standards for School Funding and the Minimum and Optimum Norms for School infrastructure, as highlighted by DBE officials there is currently no policy document that governs school maintenance but the DBE is busy drafting a maintenance policy document. Schools generally understand the procurement process stipulated by the DBE, but the turnaround time for requests to the DBE is long. As it was revealed by all the schools, that they have been granted approval for additional classrooms in the past, but there are still requests that have been submitted to the DBE that are still outstanding. This means that guidelines are given by the DBE around procuring facilities, but the turnaround time to respond to these queries was long.

The third objective was to establish the FM strategies or guidelines which allow schools to operate efficiently. The basic and minimum functionality requirements of any public school should be used to ensure that schools perform efficiently. The state relies on the SGBs to manage school environment for matters such as property administration and to affect the basic and minimum functionalities in a school. Therefore the SGBs understanding of their role as stipulated by SASA is very important, as this drives the strategy for the administration, controlling, maintaining and improving of school buildings to be carried out efficiently. From the data collected, the SGB of School G which is a former Model C school showed a good understanding of their roles as outlined by SASA. The SGB's support the school in initiatives that school the campus manager suggests as they trust the campus manager's decision as the campus manager has been a member of the SGB before. School G is aware of the Provincial DBE's 'responsibility regarding major repairs and hence they have used this option to request additional classrooms which were granted by the DBE. School G constantly engages with other schools so as to benchmark and assess best practice. As a result of that the school campus manager has formed fruitful relationships with school facilities managers from other schools. So a strong support of the SGB ,a full understanding of how best to effectively use the DBE's procurement system to request major repairs and constant benchmarking exercises have proved fruitful for school G. Overall the facilities of School G are managed more efficiently.

The fourth objective was to establish whether there are replicable FM strategies that can be applied to dysfunctional public schools from other public school models in South Africa. There are definitely strategies that can be applied, as identified during the data collection. The full commitment of the SGB and support and trust of the school staff.

Benchmarking against other schools in the area that could be potentially be faced with similar challenges and constantly engaging to with custodians of facilities from other schools. The other pertinent finding was that in both former Model C schools, outsourcing of minor repairs was carried in house and that minimized the turn around. Hence having general workers that have been equipped with certain basic building trade skills allowed the operations and maintenance of school G to be more efficient and this helped the school to focus on its primary objective which is to teach. The personal development plans that the school G has for the maintenance staff empowered the general workers. In general the term facilities management is not a term that is used within schools, there are general workers or grounds men who are responsible for managing the school facilities in both the former Model C schools and previously disadvantaged schools. Each school has a different organisational structure for the maintenance team, but ultimately all the structures ultimately report to principal.

The main research question for this research wanted to find out if there are differences between facilities management strategies in former Model C schools and previously disadvantaged schools. The analysis of data collected from interviews and questionnaires revealed that there were similarities and also differences in the strategies employed in the management of school facilities in pub. There were subtle similarities in the frequency of daily inspections carried out by the schools to identify facilities that required repairing and maintenance. The differences were vast in the routine maintenance procedures this included the classroom cleaning plans. School M and school G which are both former Model C schools, have a robust classroom cleaning plan, which allows classrooms to be cleaned 1-2 times a week and deep cleaning to take place during school holidays. This was visible in the way classrooms looked during the physical observation on site.

School T has an informal cleaning plan which is moderate compared to the two former Model C schools, classrooms are cleaned by the general workers during the school holidays and during the term learners are requested to clean every Friday. This has aided the class rooms to look considerably cleaner than school R, which on the contrary the general workers only clean the classrooms during school holidays. This is clearly visible in the state of the classrooms which are filled with dirt and dust on the floors

Hence this was a similar trend element linked to routine maintenance and maintenance of sports grounds, and the toilets. The frequency of maintaining these two elements was more frequent in the two former Model C schools especially in school G and less frequent in the two township schools which were formerly referred to as DET. They were also variances in the manner the schools dealt with emergency repairs. Emergency repairs that may be required as they may endanger the health and life of the occupants of the school were prioritized in school M and school G and they were picked up early because of the job card and repair requisition process. In school T and school R items which were categorized as emergency repairs were dealt with as and when funds became available,

The first research question, analysed the deemed poor preservation of school infrastructure in township schools. Overall based on the analysis there is a poor preservation of the township schools infrastructural facilities. This is based on the basic functionality measures used to assess the condition of the school such as the sanitation basics, unsafe buildings inadequate and fencing. Differences are eminent in the manner school facilities are managed in former Model c schools and previously disadvantaged schools. This is noticeable in the poorly maintained school grounds, toilets and classrooms in both School T and School R. So overall based on the analysis there is a poor preservation of the township schools infrastructural facilities. This is based on the basic functionality measures used to assess the condition of the school such as the sanitation basics, unsafe buildings inadequate and fencing.

The second research question tried to determine what facilities management strategies are in place in public secondary schools. In general the term FM is not a term that is used within schools surveyed in this research, there are general worker or grounds men who are responsible for managing the school facilities in both the former Model c schools and previously disadvantaged schools. Each school has a different organisational structure for the maintenance team, but ultimately all the structures ultimately report to principal. All the schools have a department that deals with maintenance, though not entirely referred to as a facilities management department. The schools maintenance department have varying degrees of services that they carry out. The two former Model C schools do not only deal with maintenance issues, but handle various other supporting services such as managing the school vehicles, and the security guards. In the previously disadvantaged schools the maintenance department only deals with cleaning, the school facilities and patrolling the school at night.

The third research question probed which facilities management challenges are former Model C and township/rural schools normally faced with. Overcrowding is a phenomenon that is a major challenge in School M and School G. The current school infrastructure was not designed to accommodate the number of learners that the school has enrolled and that has put immense amount of pressure on the plumbing, usage of toilets and classrooms. This has resulted in frequent maintenance of these infrastructural elements. The previously disadvantaged institutions, School T and School R have seen a decline in the number of learners enrolled at the schools and hence overcrowding is not a major issue.

The long turnaround time from the Provincial DBE for major maintenance work, because the funds required for rehabilitation work in most instances will exceed school budget, as a result major maintenance work is the responsibility of the Provincial DBE. The long turnaround times is a problem that was experienced by all the schools in this study.

All schools complained about the annual maintenance budget from the DBE not being sufficient.

There is a lack of a documented maintenance plans, only one school has a maintenance plan which is a former Model C school. This could result in high cost due to reactive work.

The fourth research question enquired how the policy guidelines for infrastructural management in schools are prioritized in former model c and township schools. There are still gaps in the way the government has given schools direction to manage and or maintain school facilities , as highlighted by DBE officials the drafting of a maintenance policy document is still a working document. Broken elements in previously disadvantaged schools are prioritized based on funding that is available. In the former Model C schools all elements that may cause harm to learners are prioritized.

The fifth research question looked at the impact that the skewed resource allocation in South African schools has had on the management of the physical facilities of schools. The skewed resource allocation in South Africa, disempowered communities in areas where you find previously disadvantaged schools. There is more visible leadership from the SGB's in former Model C school, and this is fully supported by the assertion that Mncube made in (2009) that the managerial expertise in former Model C schools is greater and parents contribute more to running schools as compared to township schools where there is a greater reluctance to participate because of a low level of education and power struggles. The efficient running of former Model C schools can be attributed to SGBs in these schools who are able to use their financial and social resources. This research supports statements above as it was discovered that the SGBs understanding of the their roles in both previously disadvantaged School T and School R is fair, and in School T's there is limited support from the SGB around school initiatives on maintenance and the principal is expected to make most decisions related to maintenance. In school R there are power struggles within the SMT in matters regarding school maintenance. Differences are eminent in the manner school facilities are managed in former Model C schools and former DET schools, this is noticeable in the poorly maintained school grounds, toilets and classrooms in both school T and school R.

The sixth research question looked at the way infrastructural FM processes of previously disadvantaged schools could be improved. Important lessons came out of the strategies that school G utilizes, These processes can be utilized to improve the infrastructural facilities management process of other schools that are not as efficient:. The ability of the general workers from school G to carry the majority of maintenance repairs within the school allowed the turnaround times to be short in School G. Using the schools general worker to their full potential by empowering them with basic building trade skills such as plumbing, tiling, plastering, allowed the operations and maintenance of School G Benchmarking and best practice exercises are another element that assists School G in making the school efficient in managing facilities. If this tool could be adopted amongst school R and school T it could be one of the ways of overcoming the challenges that are experienced as a result of poorly managed school facilities.

5.2 Recommendations

The recommendations for this study are that firstly for the Provincial DBE to seek to achieve equity amongst schools since it is evident from the conclusions that inequality still exists in the public school systems .The DBE should give a set of guidelines to schools on how to manage core facilities in schools, especially in previously disadvantaged schools despite the current ranking of the school. This approach should be a holistic approach which gives a step by step guide to the frequency of maintaining and cleaning elements such as:

- Sanitation basics
- Buildings
- Fencing
- Classrooms
- Schools grounds

It is evident that the regular upkeep of these facilities results in healthy facilities.

The exercise of sharing knowledge amongst general workers is a very useful tool as seen in school G. Therefore general workers, facilities managers, ground men or the custodian of school facilities should share knowledge, through best practice and this should be a tool that is promoted by the DBE and school leaders .

6 References

Acker-Hocevar, M. and Touchton, D. (2002c). *How principals level the playing field of accountability in Florida's high poverty/low performing schools. Part 3.* International Journal of Educational Reform, 11:334 -346.

Alexander, K. Hamid, Md.Y. Baldry, (2008). D. *Facilities Management Processes in Higher Education*. University of Salford. Euro FM Research Monograph.

Alexander, K. (2005). *Facilities Management: Theory and Practice*. Taylor and Francis Publications. New York.

American Federation of Teachers. (2006). *Building minds, minding buildings: Turning crumbling schools into environments for learning.* A Union of Professionals. 48-0165. Washington.

Asiabaka, I.P. (2008). *The Need for Effective Facility Management in Schools in Nigeria.* New York Science Journal. Vol 1:10-21. Department of Education Foundations and Administration, Faculty of Education, Imo State University, Owerri, Nigeria.

BebaObong, L., Okey, S. and. Aniah, J. (2010). *Strategies for School Environmental Management in Nigerian Secondary Schools: A Case of Calabar Nigeria.* CCSE International Education Studies.

Bello, M.A. and Loftness, V. (2010). *Addressing Inadequate Investment in School Facility Maintenance.* Carnegier Mellon University.

Building Educational Success Together (BEST).(2005). *Recommended Policies for Public Schools Facilities.* National Trust Historic Preservation. www.21csf.org accessed August 2013.

Burns, G.J. (2007).*Invitational Leadership in Public Schools*. Dissertation Faculty of the Graduate School University of Missouri-Columbia.

Cash, C. and Twiford, T. (2012). *Improving Student Achievement and School Facilities in a Time of Limited Funding.* National Council of Professors of Educational Administration. United States of America.

Cash, C. (1993). *A study of the Relationship Between School Building Condition and Student Achievement and Behaviour*. Unpublished doctoral dissertation. Blacksburg, VA : Virginia Polytechnic Institute and State University.

Campbell, T.D. and Fiske, D.W. (1959). Convergent and Discriminant Validation by the Multitrait-Multimethod Matrix. Psychological Bulletin. 56,81-105.

Christie, P., Butler, D., and Potterton, M. (2007). *Report of the Ministerial Committee on Schools that Work.* Republic of South Africa: Department of Education -

Christie, P. (2010). *Educational Management Administration & Leadership*. Vol 38 Iss 6 pp 94–711,.Sage Journals.

Chisholm, L. (2004). *Changing Class Educational and Social Change in Post-apartheid South Africa..* edited by L Chisholm. Cape Town HSRC and Zed Books: 1-28.

Construction Industry Development Board (CIDB). (2009). *Standdard for Uniformity in Construction Procurement*: *DepartmentofTrade and Industry*.National No.3182.

Colby, J. Witt, M. & Associates. (2000).*Quality in Education* .,UNICEF,Pg 9.

Coleman,J.S. Campbel, E.Q. Hobson, C.J.,Mcpartland, J., Mood,A.M., Weinfeld,F.D. et al. (1966). Equality of Educational Opportunity. Washington,DC:U.S. Government Printing Office.

Coll and McCarthy Architects. (1998). *Maintenance Matters., Maintenance and Minor Works in Primary Schools: A Manual for Boards fof Management*. An Roinn Oideachais Agus Eolaichta, Department of Education and Science.

Cooper, I. (1985). *Teachers Assessments of Primary School Buildings: The Role of the Physical Environment in Education*. British Educational Research Journal .Vol. 11, No. 3, pp. 253-269.

Creswell, J.W. (2003). *Research Design,Qualitative,Quantitative and Mixed Method Approaches*. California,United States of America: Sage Publications Inc.

CSIR. (2007).,School *Infrastructure Performance Indicator System*., Parliamentary Grant Report., Pretoria.

Guidelines Relating to Planning For Public School Infrastructure. (2012). Department of Basic Education.

Department of Education. *Five Year Strategic Plan 2009/10-2014/15.,Gauteng* Department of Education. Version 9.

Earthman, G.I. (2002). *School Facility Conditions and Student Academic Achievement.* Virginia Polytechnic Institute., UCLA's Institute for Democracy, Education & Access.

Earthman, G. Cash, C. and Van Berkum, D. (1995). *A State-Wide Study of Student Achievement and Behaviour and School Building Condition*. Paper presented at Council of Educational Facility Planners International Conference, New York, NY.

Education in a New South Africa: The Crises of Conflict, the Challenges of Change (pp. 460-467).

Ehiametalor, E.T. (2005). *Issues of Access, Equity and Private Sector Participation in the Deregulation of Education*. Akpa, G.O. Udoh, S.U. and Fagbamiye, E.O. (Eds). Deregulating the Provision and Management of Education in Nigeria, NAEAP. Publications, Lagos, pp. 259-70.

Gallie,M. Sayed,Y. and Williams,H. (1997) . *Transforming Educational Management in South Africa*. The Journal of Negro Education , Vol. 66, No. 4.

Gibberd, J.T. and Mphutlane,L.G. (2007). *South Africa's School Infrastructure Performance Indicator System.* CSIR. South Africa.

Goddard, W. and Melville, S. (2001). *Research Methodology an Introduction*. Juta & Co Ltd.,Second Edition.,Lansdowne Durban.

Hall, K. and Giese, S. (2008). Addressing Quality Through School Fees and School Funding in South Africa in South African Child Gauge. Pendlebury, S. Lake, L & Smith. C.(eds)., Childrens Institute:University of Cape Town.

Ikoya, P.O. (2008). *Centralization and decentralization of schools' physical facilities management in Nigeria*, Journal of Educational Administration, Vol. 46 Iss: 5, pp.630 - 649

Kamper,G. (2008). *A profile of effective leadership in some South African high-poverty schools*. SA Journal of Education, Vol 28, No.1.

Karlsson, J. (2002). *The Role of Democratic Governing Bodies in South African Schools*, Comparative Education, 38:3, 327-336.

Lavy, S. (2008). *Facility Management Practices in Higher Education Buildings: A case study*. Journal of Facilities Management. Vol.6:Iss.4:Pages.303-315.,Department of Construction Science College of Architecture,Texas A&M University,College Station,Texas,USA.

Lazarus, S.J and Hauptfleish, A.C. (2010).*The application of facilities maintenance within the public sector: An exploratory study*. ASOCSA 2010-18.

Leung, M. Lu, X. Hon, I.P. (2005). *Investigating key components of the facility management of secondary schools in Hong Kong*. Facilities, Vol. 23 Iss: 5/6, pp.226 – 238.

Loosenire,M. and Hsin,Y.Y., (2001). *Customer-focused benchmarking for facilities managmement*..University of South Wales, Sydney, Australia. Vol.19:Iss 13/14:pp464-476..

Lunenburg, F.C. (2010). *School Facilities Management*. National Forum of Educational Administration & Supervision Journal. Vol. 27, No 4. Houston State University.

Mncube,V. (2009).*The perceptions of parents of their role in the democratic governance of schools in South Africa: Are they onboard*. SA Journal of Education, Vol 29,No.1.

Motala, S. and Pampallis, J. (2009). *Governance and Finance in the South African Schooling System: The First Decade of Democracy. Education Policy Consortium (EPC)*. Human Rights, Democracy and Social Justice.

National Cleaning House for Educational Facilities. (2009). *Public School Facilities Maintenance Repair and Renovation Manual.* Arkansas Division of Public School,Academic Facilities and Transportation., Little Rock.

National Department of Basic Education. (2011).*Rolling Out School Maintenance.* Discussion Document. National Department of Basic Education: Republic of South Africa.

Obong, L. B, Okey,S. and Okaba, L.A., (2010). *Strategies for school environmental management in Nigerian secondary school: A case Calabar Nigeria*. International Educational Studies.,Vol 3,No.1,, www.cccsenet.org/ies –accessed Nov 2013.

Ogbeifun, E. (2011). *Facilities management in multi campus setting : A case study of the university of the Witwatersrand*. Masters Research Report. University of the Witwatersrand.

Ogunsaju, S. (1998). *School Management without Crisis in Nigeria*, Laville Publications, Ibadan

Olajide, F.J. and Afolarin, A.O. (2012). *Evaluation of Maintenance Practice in Banking Industry in Lagos Nigeria*. International Journal of Sustainable Construction Engineering & Technology. Vol 3 Issue1 2012.

Othman, M. and Muijs, D. (2013). *Educational Quality Differences in a Middle-Income Country: The Urban-Rural Gap in Malaysian Primary Schools*. International Journal of Research, Policy and Practice, 24:1, 1-18.

Republic of South Africa.(1996b).South African Schools Act, No. 84. (Pretoria, Government Printer).

Roberts, L.W. (2009), *Measuring school facility conditions: an illustration of the importance of purpose*, Journal of Educational Administration, Vol. 47 Iss: 3 pp. 368 – 380.

Roodt, M. (2011). Research and Policy Brief:"Model C" is the model to emulate. South African Institute of Race Relations. Article published in The Star newspaper.

Saunders, M. Lewis, P. and Thornhill,A. (2009). Research Methods for Business Students. Fifth Edition. Pearson Education.

Saunders, L. (2000). *Key Issues Concerning School Effectiveness and Improvement.* World Bank Project Effective Schooling in Rural Africa Report 2.Shanklin, N., Kozleski, E.B. Meager, C. Sands, D.

Joseph, O. and Wyman W 2003. *Examining renewal in Urban High School Through the Lens of Systemic Change.* School Leadership and Management, 23:357-378.

Smit, J. and Oosthuizen, I. J. (2011). *Improving School Governance through Participatory Democracy and the Law. Structural*. South African Journal of Education.,Vol 31:55-73.

Smith, J. and Stewart, P. (2007). *State-wide schools maintenance audit in Victoria, Australia: The framework and process*. Structural survey, Vol.25 Iss1, pp.24-38.

Spaull, N. (2012). *Poverty and Privilege: Primary School Inequality in South Africa*. Carnegie III Conference UCT.

South African Institute of Civil Engineers (SAICE). (2011). Infrastructure Report Card for South Africa. – www.saice.org.za .Accessed. 13 January 2014.

Taylor, N. (2006a) Focus on : Challenges across the education spectrum. JET Bulletin,15:1-9.

UNESCO. (2013). Systematic Monitoring of Education for All Module A4: Use of Information in Monitoring, Planning and Management.

Walters, M. (1999*). Performance measurement systems – a case study of customer satisfaction."* Facilities. Vol. 17, No. ¾, p. 97-104.

Xaba , M.I.(2012) . *A qualitative analysis of facilities maintenance — A school governance function in South Africa.* School of Education Sciences. North-West University, Vaal Triangle Campus, South Africa.

Yin , R.K. (2009). *Case Study Research: Design & Methods Applied Social Research Methods.* Sage Publications.

Zucker, D.M. (2000). *How to do case study research*., University of Massuchusetts.

Strategic Facilities Management Community (www.network.corenetglobal.org) accessed July 2014.

Articles

Shirley, R. (2012). The South African School System.

Makikana, A., 7 May 2013., The Mail & Guardian.

Personal Comments

1. Marius Roodt 2011. Per Comm.
2. Judge B Mbha, 2011 Per Comm.

Appendix A – Interview Schedule

Appendix B - Questionnaires

Appendix C – Department of Basic Education Approval Letter

Appendix D – University Ethical Clearance