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INTEGRATED PROJECT DELIVERY SYSTEMS AS AN ALTERNATIVE PROCUREMENT METHOD TO REDUCE PROJECT DELAYS

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ABSTRACT
PURPOSE:
Construction project delays have become almost inevitable within the South African Public sector with a variety of contributing factors. Evidence suggests the construction procurement method to be a primary attribute. The objective of this paper is to examine the existing construction procurement methods, which control the processes, order of operations and lines of communication within the public sector, and to investigate if an alternative procurement method, particularly Integrated Project Delivery System (IPDS), could potentially resolve some of the prevailing issues.

DESIGN:
The data for this study was collected by means of a survey, which was distributed, to 20 construction professionals via the convenience sampling method. The data was analyzed by means of comparative analysis. A set of statistical data emerged from the results. Further interviews within case studies were conducted. Ten cases were selected and the relevant professionals were interviewed based on 15 semi-structured questions. The data was analyzed using content analysis techniques and emerging themes were observed.

FINDINGS:
The Traditional Procurement method is implemented on construction project by default or due to familiarity and is not necessarily the most appropriate system. The Traditional Procurement System is adversarial in nature and the industry has revealed that a method, which possesses more relational features, could have the potential to yield improved results. The traditional method has also been found to limit the involvement of the contracting party during inception stages, which is viewed as disadvantageous to the project delivery success. The findings of the study indicated that the contractor’s involvement should be considered invaluable to the project success due to the possible reduction in construction time, delays and improved buildability as a result.

VALUE:
There exists limited studies, which examine the causes of the delays and disruptions on construction projects in order to have an increased understanding of this phenomenon in an effort to develop preventative actions. Project delivery success has been expressed to be as important as a national priority in order to reduce cost overruns and dissatisfied clients. This paper contributes to understanding the issues by means of an evidence-based approach.

Keywords: Procurement, project delays, public sector, Traditional procurement, Integrated Project Delivery System
INTRODUCTION
A project has been defined as an attempt to coordinate human, financial and material resources to undertake a specified scope of work defined by unique parameters, namely cost, time, quality and utility, in order to attain a beneficial change defined by quantitative and qualitative goals. Timeous project completion is frequently an indicator of efficiency, however, there are varying factors arising from multiple sources that affect this outcome. Primary sources have been identified as the involvement and performance of parties and flow of contractual relations. Procurement describes the contractual and interactive flow of relationships among the client, professional team and contracting team within the construction project. The selected method of procurement is reliant on the nature of the work, the scope of the work, the risks associated with the work, the pricing basis and the way the work is carried out. The method of procurement also depends on familiarity based on previous projects of a similar nature. The Traditional Procurement System (TPS) has been identified as the default method elected on public sector projects. The TPS has also been identified as one which fails to accurately include the client-contractor relationship and promotes a method which is largely adversarial in nature. The appointment of a contractor to carry out the specified work on a project, despite the intricacies involved, once the construction is ready to commence as opposed to involving the contracting party in the inception process is a result of an outdated Traditional Procurement System. The route of appointing a contracting party based on the lowest tendered price rather than to suit the specific requirements of the project and client appears to be an established trend rather than an informed decision. The separation of design from construction, which is a feature of the TPS, has resulted in lack of consideration towards the constructability on projects, ultimately providing for project delays.

DELAYS AND DISRUPTIONS
A delayed project is one that exceeds the stipulated completion date or is lagging in its scheduled program. The consequences of this delay vary according to the respective stakeholders. Major consequences of delays are increased costs to the project, loss of potential income to the client, increased overheads and inflated pricing due to time elapsed to the contractor. It is therefore in the interest of all parties to the contract to investigate the causes of these costly delays in an effort to mitigate the possibility of this risk. Table 1 illustrates an analysis of the groups of delay causes and a ranking of their index accordingly, identifying contractual relationships in the top three. Procurement policy may provide for clear and definitive allocations of risks (and responsibilities and liabilities) among stakeholders but all possible risks/uncertainties are not foreseeable and quantifiable at the outset. Even the foreseeable risks may change in importance and may influence some other risks, requiring considerable adjustments during project execution. Classically “complete” contractual arrangements are therefore not suitable for proper risk management. The objective of risk management ought to be to minimize the total cost of risks to a project, not the cost to any parties separately. An argument has been presented that the fault lies within the management of the system and perhaps not the system itself.

Table 1: Causes of Delays and its Ranking Index

<table>
<thead>
<tr>
<th>Rank</th>
<th>Group of delay causes</th>
<th>Group importance index</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Financing</td>
<td>54.33</td>
</tr>
<tr>
<td>2</td>
<td>Materials</td>
<td>53.67</td>
</tr>
<tr>
<td>3</td>
<td>Contractual relationships</td>
<td>32.38</td>
</tr>
<tr>
<td>4</td>
<td>Changes</td>
<td>47.47</td>
</tr>
<tr>
<td>5</td>
<td>Rules &amp; regulations</td>
<td>45.00</td>
</tr>
<tr>
<td>6</td>
<td>Manpower</td>
<td>44.83</td>
</tr>
<tr>
<td>7</td>
<td>Scheduling &amp; control</td>
<td>43.39</td>
</tr>
<tr>
<td>8</td>
<td>Equipment</td>
<td>40.00</td>
</tr>
<tr>
<td>9</td>
<td>Environment</td>
<td>30.33</td>
</tr>
</tbody>
</table>

PROCUREMENT
Procurement provides an outline of the roles and responsibilities for parties to a contract. Its contribution has been acknowledged as a key influence in the success of a project and ultimately, client satisfaction. The client’s objectives vary for each project and these objectives influence the decisions made on the project. The selection of an appropriate procurement method is therefore fundamental to the professional team, contracting team and the client.

TRADITIONAL PROCUREMENT SYSTEMS (TPS)
The Traditional Procurement System makes provision for the consulting team to carry out the design, contract administration and to control the costs of the project. The contractor is appointed to carry out the work as stipulated by the scope of works, which includes subcontractors, suppliers and workmanship of materials. Under the TPS, the contractor is awarded a project based on a competitive tendering process comprising of detailed documents with all the project particulars available at the time.

There exist circumstances where the contractor is appointed at an earlier stage under a variant of the TPS known as the “Accelerated Traditional method”. This process entails a two stage tender or a negotiated tender. This will allow the design and construction to occur simultaneously within the project parameters. While this variant of the TPS allows the contractor to commence works on site at an early stage, the project then carries higher risks of cost uncertainty. Evidence suggest that TPS hosts adversarial relationships among the project team because of the fragmentation of the design and construction stages. The lack of innovation and higher cost and time implications are other highlighted results. These results indicate that the selected TPS does not always provide value for money.

PUBLIC SECTOR PROCUREMENT
Procurement within the public sector in South Africa is employed as a policy tool because of the Apartheid era. A procurement system is not limited to just procurement processes, it also includes:

- rules and guidelines governing procedures and methods;
- procurement documents inclusive of terms, conditions, procedures and requirements;
- risk / quality oversight (governance and performance) controls; and
- organizational policies which address issues such as:
  - the usage and application of particular procurement procedures;
  - the requirements for recording, reporting and risk management;
  - the procedures when handing specific procurement issues;
  - utilizing procurement to promote social and developmental objectives; and
  - the allocation of responsibilities for the performance of activities.

The constitutional objectives, which are required in order for a procurement system to be developed within the South African public sector, are:

- Primary objectives: Procurement system is to be fair, equitable, transparent, competitive and cost effective as identified by Section 2171 of the constitution.
- Secondary objectives: Procurement policy may provide for categories of preference in the allocation of contracts; and the protection or advancement of persons, or categories of persons, disadvantaged by unfair discrimination as per Section 2172 of the constitution.

INTEGRATED PROJECT DELIVERY SYSTEM (IPDS)
Integrated Project Delivery System has been defined as an approach, which integrates people, systems, business structures and practices into a process that collaboratively connects the skills and insights of the project participants to obtain optimal results which heighten the value to the owner and reduces waste while still maximizing efficiency throughout the phases of design, fabrication, construction and operation. There are a variety of contractual agreements to which IPDS principles can be applied to and the IPD teams may include members other than the basic trio, namely owner, architect and contractor. The distinguishing characteristic on integrated projects is the optimized collaboration among the owner, prime designer and constructor beginning at an early stage and lasting through to project handover.

Early involvement of all participants: a vital differentiating factor of IPD is the engagement of all parties at the early stages of the design phase. This collaboration can significantly alleviate the problem of fragmentation between design and construction teams. This process has the ability to optimize efficiency and avoid variations resulting in delays and cost overruns. There is no specific type of technological tools required, however information technology synonymous with Building Information Modelling (BIM) has been found to improve the effectiveness of the process in all phases of the project.

IPDS: The Prime Contract
IPDS diminishes the hierarchy of project participants that is synonymous with the traditional methods. There exists a single binding contract between the team and the client. This contract can be adapted to any existing form of contract, which stipulates the scope of the project, the
costs and planning schedules. The team as a single entity will sign the contract. The Multiparty Integrated Project Delivery Agreement, also identified as ConsensusDocs 300 (CD300), provides for a form of contract for IPDS. This agreement addresses key issues such as a multiparty agreement between owner, designers, and constructors, cost reimbursable payments, and risk sharing amongst relevant participants. Lean Construction techniques in the planning of the project, design as well as construction have been incorporated into the CD300. IPD was developed in an effort to eliminate the effect of different objectives amongst the participants to a contract, which is inherent in Traditional methods. The inclusion of the Lean Construction techniques into the CD300 facilitates the process of aligning all aspects of the construction process throughout. In an effort to diminish inefficiencies, Lean Construction process focuses on improved planning, greater collaborative initiatives between the owners, the designers and the construction team and creating incentives, which are project based as opposed to individually based outcomes.17

TPS vs IPDS

Figure 1 provides a comparison of the features of the Traditional Procurement System versus the Integrated Procurement Delivery System.

Traditional Project Delivery

Integrated Project Delivery

Process
Concurrent and multi-level; early contributions of knowledge and expertise; information openly shared; stakeholder trust and respect

Teams
An integrated team entity composed key project stakeholders, assembled early in the process, open, and collaborative

Risk
Collectively managed; appropriately shared

Compensation/Reward
Team success tied to project success; value-based

Communications/technology
Digitally based, virtual; Building Information Modeling (3, 4 and 5 dimensional)

Agreements
Encourage, foster, promote and support multi-lateral open sharing and collaboration; risk sharing

Legislature
-Procurement system is to be fair, equitable, transparent, competitive and cost effective as identified by Section 217 (1) of the constitution

-Procurement policy may provide for categories of preference in the allocation of contracts; and the protection or advancement of persons, or categories of persons, disadvantaged by unfair discrimination as per Section 217 (2) of the constitution

RESULTS AND DISCUSSIONS

Survey Analysis

The findings from the survey, which was conducted on various project stakeholders, assessed the relationships and flow of communication, which exists on projects within the public sector and the desired changes to optimize efficiency on these projects. A total number of 20 survey responses were received. The results were analysed as illustrated in Table 2 below.

Table 2: Communication and Relationship Change Analysis

<table>
<thead>
<tr>
<th>Project Stakeholders</th>
<th>Unilateral Relationship</th>
<th>Bilateral Relationship</th>
<th>No Relationship Indicated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Client – Project Manager</td>
<td>0</td>
<td>-2</td>
<td>2</td>
</tr>
<tr>
<td>Client- Architect</td>
<td>-1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Client-Quantity Surveyor</td>
<td>0</td>
<td>12</td>
<td>8</td>
</tr>
<tr>
<td>Client-Engineer</td>
<td>1</td>
<td>-9</td>
<td>8</td>
</tr>
<tr>
<td>Client– Contractor</td>
<td>-1</td>
<td>-2</td>
<td>3</td>
</tr>
<tr>
<td>Client-Subcontractor</td>
<td>-1</td>
<td>-2</td>
<td>3</td>
</tr>
<tr>
<td>Client-Manufacturer</td>
<td>0</td>
<td>-1</td>
<td>1</td>
</tr>
<tr>
<td>Project Manager– Architect</td>
<td>-3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Project Manager– Quantity Surveyor</td>
<td>-1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Project Manager–Engineer</td>
<td>-1</td>
<td>-2</td>
<td>3</td>
</tr>
<tr>
<td>Project Manager–Contractor</td>
<td>5</td>
<td>-6</td>
<td>1</td>
</tr>
<tr>
<td>Project Manager–Subcontractor</td>
<td>-2</td>
<td>-1</td>
<td>3</td>
</tr>
<tr>
<td>Project Manager–Manufacturer</td>
<td>-2</td>
<td>-5</td>
<td>7</td>
</tr>
<tr>
<td>Architect-Quantity Surveyor</td>
<td>1</td>
<td>-5</td>
<td>4</td>
</tr>
<tr>
<td>Architect– Engineer</td>
<td>1</td>
<td>-2</td>
<td>1</td>
</tr>
<tr>
<td>Architect– Contractor</td>
<td>2</td>
<td>-5</td>
<td>3</td>
</tr>
</tbody>
</table>

The second scenario required the respondent to connect various project participants/stakeholders based on a desired flow of communication on public sector construction projects. They were provided options of single flow communication or two-way flow of communication and were advised to comment if necessary.

The study further analyzed case studies. Ten case studies on projects within the public sector were identified and interviews conducted based on those cases. The participants were selected via convenience sampling. The cases were identified based on construction projects within the public sector that were complete and had experienced delays in order to analyze the details of the delays.

RESEARCH METHODOLOGY

This qualitative study was conducted in KwaZulu-Natal over a period of 2 months. A survey was developed for project participants to populate based on their professional experience on projects within the public sector. All efforts were made to ensure the design of the survey allowed the participants to understand the instrument with ease and to indicate responses successfully.16 Twenty surveys were distributed for analysis, which consisted of 2 scenarios:

The first scenario required the respondent to connect various project participants/stakeholders based on the flow of communication that currently exists on public sector construction projects. They were provided options of single flow communication or two-way flow of communication and were advised to comment if necessary.

Figure 1: Traditional Delivery vs Integrated Delivery | Adapted from the AIA 2007 and National Treasury 2012.
The survey findings revealed that there were 204 added or altered directional lines of communication between the existing procurement model that was predominantly used in the public sector and the desired flow of communication as part of procurement arrangements. The project participants illustrated a preference to a procurement model and contractual arrangement that allows for more interaction and communication between all the various stakeholders. The significant increase in desired relationships and corresponding decrease in lack of relationships hints at the need for a system which is more relational that could potentially yield improved results when compared against current practices.

Case Study/ Interview Analysis

The study provided insights into the experience and opinions of key stakeholder on procurements processes.

Table 3: Reasons for Project Delivery Failure within Public Sector (n=10)

<table>
<thead>
<tr>
<th>Primary Reasons for Project Failure</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Delays</td>
<td>70%</td>
</tr>
<tr>
<td>Budget</td>
<td>40%</td>
</tr>
<tr>
<td>Other</td>
<td>40%</td>
</tr>
</tbody>
</table>

Project delivery success or failure is identified by predetermined factors. Against the prevailing context, all respondents claimed that most projects in the public sector did not satisfy the usually required project objectives, listing the primary causes for project delivery failure as delays (70%) and budget overruns (40%) as shown in Table 3.

The participants were asked whether a relationship between the method of procurement and successful project delivery existed. Table 7 summarizes the responses.

Table 4: Project Delivery Success Rate (n=10)

<table>
<thead>
<tr>
<th>Percentage of Projects which Attained Complete Project Delivery Success</th>
</tr>
</thead>
<tbody>
<tr>
<td>0%</td>
</tr>
<tr>
<td>0-10%</td>
</tr>
<tr>
<td>50%</td>
</tr>
<tr>
<td>&gt;50%</td>
</tr>
</tbody>
</table>

The results from table 4 indicate that most respondents (90%) reported a success rate of less than 50% on public sector projects that they have been involved in.

Table 5: Reasons for project failures (n=10)

<table>
<thead>
<tr>
<th>Reasons for Failed Projects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poor project briefing and scope definition</td>
</tr>
<tr>
<td>Delayed decision-making and processes</td>
</tr>
<tr>
<td>Limited stakeholder experience</td>
</tr>
<tr>
<td>Poor communication</td>
</tr>
<tr>
<td>Political interference</td>
</tr>
<tr>
<td>Lack of planning</td>
</tr>
<tr>
<td>Poor project documentation and procurement process alignment</td>
</tr>
<tr>
<td>Budgetary constraints</td>
</tr>
</tbody>
</table>

Table 5 is indicative of the primary reasons for project failure. When compared to the study in [8], similarities are evident. The results revealed that project briefing and defining the scope; delayed decision-making; limited stakeholder experience and poor communication appear to be the dominant issues contributing to project failures.

Table 6: Procurement route primarily selected on public sector projects (n=10)

<table>
<thead>
<tr>
<th>Procurement Route</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Traditional Method</td>
<td>100%</td>
</tr>
<tr>
<td>Design-Build</td>
<td>10%</td>
</tr>
<tr>
<td>Collaborative Methods</td>
<td>0%</td>
</tr>
<tr>
<td>Management Orientated</td>
<td>0%</td>
</tr>
</tbody>
</table>

All respondents identified the Traditional Procurement method as the primarily selected route within the public sector. It was further discovered that the reason for the selection of this method is due to alignment with the legislation of the country. TPS has been presented as the most familiar system which satisfies all the requirements of the legislature.

Table 7: The relationship between the method of procurement on a project and successful project delivery (n=10)

<table>
<thead>
<tr>
<th>The relationship between an appropriate procurement method and project success is directly proportional</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
</tr>
<tr>
<td>No</td>
</tr>
</tbody>
</table>

Table 8 lists the responses.

Table 8: Use of alternative relational and non-adversarial procurement routes (n=10)

<table>
<thead>
<tr>
<th>The respondents indicated that they have explored implementation of alternative procurement methods, which resulted in a positive outcome in all instances.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
</tr>
<tr>
<td>No</td>
</tr>
</tbody>
</table>

Table 9: Willingness to implement IPDS (n=10)

<table>
<thead>
<tr>
<th>Consideration of IPDS Implementation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
</tr>
<tr>
<td>Uncertain</td>
</tr>
<tr>
<td>No</td>
</tr>
</tbody>
</table>

While majority of the participants (60%) indicated from Table 9 that the method would be a welcomed alternative, 30% displayed hesitation to implement this approach. The barriers to implementation are owing to the historical political background that is inherent in South Africa.
CONCLUSIONS

The findings suggest that while the Traditional method is primarily selected on public sector projects, it may not always provide for the most appropriate method. Stakeholders indicated that the Traditional Procurement route is synonymous with segregation of project participants. The findings suggest that this fragmentation can be associated with one of the primary causes for delays, disruptions and cost overruns on projects. When an alternate route, which fosters relational features as opposed to being adversarial in nature, was introduced, the participants revealed interest in implementation. The stakeholders identified key features within IPDS, which would assist in reducing delays, disruptions and the consequential cost implications on projects. Potential barriers to implementation within the public sector were highlighted.

The study found that the South African legislative framework appears to have a great impact on the implementation of alternative procurement methods. Any alternate route explored would need to be adaptable to the existing framework in order to be considered as a viable option. While the stakeholders have highlighted barriers to implementation, the benefits of IPDS appeal to them. The study provides evidence that a change in the methods is desperately needed. There exists a resistance to change among a few professionals due to the risk associated with exploring an option, which is unfamiliar, however the industry is evolving and it is essential that South Africa keeps up in order to improve project delivery success and the industry as a whole.

RECOMMENDATIONS FOR FUTURE STUDY

Based on the findings of this research, the following recommendations are proposed for future research endeavors:

- The study was confined to research within the KwaZulu-Natal region. It would be beneficial to analyse similar information within the other regions in order to determine if they are faced with similar shortcomings or to ascertain if issues are region specific.
- To investigate if potentially implementing an alternate approach to procurement on a project from the inception stages would affect the outcome and to analyse if this benefits of this outcome will outweigh the risk involved.
- The legislative and regulatory framework has been proven rigid and the forms of contract, which are developed, follow suit in terms of their rigidity and inability to adopt features of more relational approaches. An analysis of how this influences the development of procurement systems and its contribution to an appropriate method being implemented would be useful in creating greater efficiencies on projects.
- To analyse the extent of involvement and risk each stakeholder has on a public sector project in order to determine the effect this has on their overall outcome and performance.

REFERENCES

ABSTRACT

Purpose of the paper

The implication of using poor construction materials is well documented. There have been numerous attempts to promote the use of good quality materials such as introducing design, building and material standards with little success. This study investigates the nature and extent of compliance of common building materials, namely; building sand, clay bricks, concrete blocks and cement with the South African National Standards (SANS).

Design/methodology/approach

In 2018, 517 hardware stores were telephonically contacted, throughout nine provinces of South Africa, to inquire about purchasing some building materials for the construction of a domestic house. All the building materials were required to meet the requirements stipulated by the National House Builders Registration Council (NHBRC), with respect to building and construction standards and good quality materials, which should be approved by the South African Bureau of Standards (SABS) and/or certified as being compliant by the National Regulator for Compulsory Specifications (NRCS).

Findings

It was established that cement is the only SABS or NRCS approved building material that is available to most suppliers for selling to the housing consumer. Other materials, such as building sand, clay bricks and concrete blocks presented a significantly low level of compliance. It is obvious that by applying the same principle, similar to the legal requirements governing the selling of cement to the public, to other building materials investigated for this study, that the availability of SABS or NRCS approved building materials available and/or accessible for purchase by the housing consumer or the public, in general, would be improved.

Value

The housing consumer is not protected by the NHBRC policy as intended, since consumers do not have easy access to basic good quality building materials other than cement.

Keywords: Basic building materials, Masonry, South Africa National Standards

BACKGROUND AND INTRODUCTION

Masonry walls perform a variety of applications and functions, which include vertical support [1], thermal and sound insulators [2], amongst others. When well-constructed, there are less costs involved for future maintenance [3]. However, materials of substandard quality, inferior construction practices, shortage of fundamental knowledge and training and poor workmanship, threaten the benefits of constructing these walls [4]. Masonry walls are built by laying mortar beds between masonry units and at head joints. This seemingly simple process requires effective and proficient skills to execute [5]. Site supervision is necessary to ensure that work is executed properly and that construction standards are maintained [6]. Good supervision helps to avoid defects that may later require remedial work, which leads to wastage of both funds and building materials [7].
South Africa is experiencing a significant shortage of low-cost houses for millions of people [16]. Speaking in general, rapid population growth, accompanied by urbanization, is the main cause of housing problems in developing countries. This growth has led to a severe shortage of housing, especially for the financially disadvantaged since they cannot afford the monthly repayments on mortgage bonds [16]. The resultant use of substandard materials in construction has led to non-compliance with respect to the quality of building materials. The NHBRC study alerts the domestic housing consumers and all concerned parties about the difficulty of finding good quality building materials, which are fundamental in avoiding defective buildings, in general, ignoring other possible drawbacks such as the design and construction flaws.

In 2018, 517 hardware stores were telephonically contacted throughout nine provinces of South Africa to inquire about purchasing some building materials for the construction of a domestic house. The researcher was an ordinary citizen who was going to purchase four types of building materials, namely: building sand, clay bricks, concrete blocks and cement to build a house which must be reroofed with NHBRC. Hence, all materials had to be approved by the South African Bureau of Standards (SABS) or by the National Compulsory Specification (NCRS) for NHBRC.

There is no doubt that if similar principles governing the selling of cement to the public is applied to all building materials, then (1) non-complying building materials would diminish in hardware stores as it would be illegal to keep them, (2) strictly compliant building sand, clay bricks and concrete blocks with respective standards would begin to be more available on the market and (3) this would create an equal and fair competition stance between the suppliers and/or the hardware stores.

With these questions in mind and in view of the current state of the masonry industry, with respect to the quality of building materials claimed, an investigation into the nature and magnitude of non-compliance with respect to the South African National Standards (SANS) is necessary to comply with the requirements of the NHBRC. The study alerts the domestic housing consumers and all concerned stakeholders about the difficulty of finding good quality building materials, which are fundamental in avoiding defective buildings, in general, ignoring other possible drawbacks such as the design and construction flaws.

However, even some professionals have not been performing their duties correctly and have failed to ensure that relevant building regulations are followed [14]. Various authors have reported a misuse of valuable resources and fragmentation of the construction industry and have called for the improvement of quality [13]. Governments have long been encouraged to provide or promote training that fits the needs of the community [13], such as in the construction sector. Moore and Wagner advised that the lack of operational and effectual training in construction usually results in fatal events [17] which are not only limited to collapsing masonry walls, timber roofs, buildings but to the factors leading to them: poor quality materials.

For any organisation to succeed, leaders are needed with experience and good leadership skills, accompanied by a strategy that encourages productive activities [18]. There are various types of organisations, such as, legal types, educational institutions, governments, non-governmental, political, and charitable [18]. The strategy of an organisation grossly determines whether it is going to succeed or fail [19]. Organisations participating in the construction industry are not unique to a point that they are immune to the challenges faced by their counterparts. Organisations visualise the same challenges [19]. South Africa has organisations required to encourage the good quality of new domestic housing with respect to governance on materials used in constructing them, building practices and design standards. The two most well known are the NHBRC and SABS.

The NHBRC is a home building industry legislative body whose objective is to help and safeguard housing consumers who are subjected to contractors who supply housing units of bad design, poor workmanship and material of bad quality. The Housing Consumer Protection Measures Act, 1998 (Act No.95 of 1998) governs the NHBRC. The NHBRC states that the role of the NHBRC is to: a) Represent the interests of housing consumers by providing warranty protection against defects in new homes; b) Regulate the home building industry; c) Provide protection to housing consumers in respect of the failure of home builders to comply with their obligations in terms of this Act; d) Establish and to promote ethical and technical standards in the home building industry; e) Improve structural quality in the interests of housing consumers and the home building industry;

LITERATURE

Studies conducted by architects, consulting engineers, and building contractors have proven that the lack of skills and knowledge among labourers in the construction industry, has been the main cause of defects in buildings/structures. Such defects affect project management by prolonging the project and causing financial strain [20]. It is for this reason that competent personnel are defined as persons who have a tertiary qualification for the relevant job, who have gained two years of relevant experience in the relevant field/position and who are trusted to ensure compliance with applicable standards [13].

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However, despite the existence of the NHBRC and Building Control at local government and municipal levels, the construction industry is challenged by the fact that any structural issues that erupt are directly associated with the builder. The two associations do everything they can to fault the builder for such issues. Currently, the NHBRC has less control over the quality of building materials than they have on home builders and structural engineers, leaving that part of the construction industry vulnerable. This leaves material suppliers free of the responsibility to ensure good quality materials. The South African government is guided by the ‘Batlo Pele’ principle, which translates to ‘People First’. In respect of this principle, government organisations, such as NHPRC, need to assess their customer satisfaction and the quality of their service according to their customers, with the aim of improving their services [22].

The second organisation is the SABS. This is a South African statutory body set up under the 1945 Standards Act (Act No. 24 of 1945) and continues to operate under the latest edition of the 2008 Standards Act (Act No. 29 of 2008). The SABS is a domestic organisation for the promotion and maintenance of commodity-related standardization, quality and service provision. SABS provides industry-specific certification, testing, consignment inspection and other services. SABS Approval Mark ensures that products are secure, fit for purpose and give redress to consumers. The new Standards Act and the National Regulator for Compulsory Specifications Act were also promulgated in September 2008. Under this legislation, the former SABS Regulatory Division set up the NROS, a new organisation that also resides within the Trade and Industry Department [23].

The basic common building materials used in building domestic houses: building sand, clay bricks, concrete blocks, cement, brick force, plaster sand, wall ties, hoop irons and concrete lintels. With respect to mortar, a mixture of sand, cement and water are used. The quality of each ingredient is crucial to achieve good quality mortar. The mortar strength depends on the water retention, brick surface texture, brick humidity content and brick surface absorption are factors influencing the interface...
bond [24]. These ingredients integrate to form structural elements, such as masonry walls. Hence their quality is vastly important. To give an example, it is well accepted that bond strength is dependent on the unit and mortar properties and also the condition of the unit interface [19]. This study investigates the most commonly used building materials namely, building sand, clay bricks, concrete blocks and cement. SANS 50197-EN 197-1 regulates the quality of cement, which is further referred to in the Compulsory Specification. The Specification for Cement published by Government Notice R 544 entails that the specifications of Annexure B [28] should be used to label/brand all cement packaging. However, the display of the SABS logo on a cement bag is no longer a requirement, thus consumers are urged to also look for the NRCS stamp of approval at the back of a cement bag. Burnt clay units should comply with SANS 227. 2007. Each batch of units should be marked and accompanied by an expedition note or a consignment note containing the following information: (1) the name or trade name of the manufacturer or trade mark; (2) the class and size of the units; (3) the nominal compressive strength of the units; (4) the grade of the units and (5) whether the units are solid or hollow. Concrete masonry units should comply with SANS 1215:2008. Each batch of units should be marked and accompanied by a dispatch or consignment note containing the following information: (1) the name, trade name or trade mark of the manufacturer; (2) the date of manufacture or the associated code number; (3) the solid or hollow units; (4) the size of the units; (5) the nominal compressive strength of the units; (6) the average drying shrinkage; (7) where applicable, the colour of the facial units with a coloured finish and (8) where applicable, whether the units contain a slag or clinker or burnt clay brick. Mortar sand should comply with SANS 1090:2009. Similar to mortar, the workability is significantly influenced by the features of the constituent components, particularly the aggregate [27]. The importance of the shape of sand particles and their geometric properties has been recognised to influence the workability of mortars [18]. Mortar workability depends on the physical characteristics of the aggregates, such as absorption and friction [28]. Mortar that uses fine sand requires 25–30% more water. The water retentivity of cement mortar is susceptible to sand gradation, as opposed to lime mortar, where sand gradation does not affect water retentivity [28]. It is important to note that there is restricted information on the impact of the water with reference to the following: cement ratio and sand ratio to mortar strength [13].

Codes of practice are in place to ensure minimum efficiency, compliance with safety specifications, guaranteed consistency and repeatable product/system/process, and the interface with other standards. This is necessary to enable compatibility between standards, most importantly the voluntary ones. Therefore, each delivery of bin or stockpile should be accompanied by a document certifying compliance with SANS 201 (grading and fineness modulus), SANS 201 (dust content), SANS 6244 (clay content), SANS 5832 (organic impurities), SANS 5834 (soluble deleterious impurities) and SANS 6254 (dry shrinking of mix). As the mining of sand is not fully controlled throughout South Africa, its quality may be compromised by many issues, which may include the actual source of the mined sand, the method used to transport the sand and the manner in which the sand is stored [29]. Sand mining should be monitored strictly to preserve it [30]. Inevitably, sand that is mined illegally is not likely to be inspected for code compliance for the envisioned purpose. In most parts of South Africa, it is less likely that a building sand buyer will independently investigate compliance. The importance of the shape of sand particles and their geometric properties has been recognised to influence the workability of mortars [18]. Mortar workability depends on the physical characteristics of the aggregates, such as absorption and friction [28]. Mortar that uses fine sand requires 25–30% more water. The water retentivity of cement mortar is susceptible to sand gradation, as opposed to lime mortar, where sand gradation does not affect water retentivity [28]. It is important to note that there is restricted information on the impact of the water with reference to the following: cement ratio and sand ratio to mortar strength [13].

Shortage of skills and adequate knowledge is hindering the progress of the industry, which then affects the standards, compliance and quality in the construction industry, as well as the country’s social and economic infrastructure [40]. According to Schliechter, et al. [41] and Jordaan and Barry [44], skill shortage is a consequence of dissatisfaction, which has resulted in a significant shortage of skilled labour in South Africa. Kamanga and Steyn [45] stress that the biggest challenge faced by the construction industry is the shortage of crucial skills and knowledge among technical labourers, which is further supported by Othuman Mydin, et al. [44] who advise that building failures or deficits result from poor workmanship. The industry is now in need of innovative solutions to address its challenges [46]. 

Other parties participating to promote and/or ensure good quality materials are the building control officers who are guided by the act to provide guidance on/approve plans, specifications and submission of documents information and compliance. Local authorities have the liberty to refuse to grant approval if they feel that the building will cause harm to life or property. The Act (Act 103 of 1977) further permits the minister to forbid the use of certain methods and/or materials that may be harmful to life or property. The Act has the power of providing safe buildings to the South African society since it provides practical requirements that concern health and safety. The Building Regulations (the application of the National Building Regulations) SANS 10400 provides specific guidance to ensure that the intentions of the Act are achieved in practice. Watermeyer proposed that the industry re-evaluates their method to public safety and formulate a plan of action that will ensure that the current defects do not compromise the right to a safe and healthy environment for South Africans [46].

Municipalities, especially those in rural areas, usually lack the capacity, technical skills and quality assurance to supervise the workmanship but more often than not, still appoint local contractors who also lack sufficient skills to build houses [47] and thus make a bad situation worse.

Last but not least, professional engineers or persons approved by the local authority are selected to design, to meet or provide material for the construction of a domestic house. Building materials were for a house that must comply with the requirements of the NBHRC with respect to the building standards and materials used, which should be SABS or NRCS approved. While the use of telephones for qualitative interviews was generally considered a lower alternative to face-to-face interviews. Typically, the collection of qualitative data is common and well-represented in research literature. The purpose of the study was to provide an alternative to face-to-face interviews. However, qualitative interviews have some advantages such as providing a way to generate empirical information [51].

For qualitative interviews, the accepted standard is to conduct them face-to-face. Typically, the collection of qualitative information by telephone is considered only when a face-to-face interview is not feasible. As for this study, interviews were conducted in nine provinces.

METHOD

The literature review provided insight into the depth of the problem with respect to the quality of building materials with respect to compliance with the standards. The study investigates the availability of quality building materials. If these materials are easily available to the public, the expectation of NBHRC to require materials that are compliant for the purpose intended, is possible and vice versa. If good quality materials are difficult to find, then the consumers of homes are not protected as intended by the NBHRC policy.

Throughout nine provinces of South Africa 517 hardware stores were telephonically contacted to inquire about purchasing building materials for the construction of a domestic house. Building materials were for a house that must comply with the requirements of the NBHRC with respect to the building standards and materials used, which should be SABS or NRCS approved.
The study focused on hardware stores between the capital and largest city of each province. Organising and conducting face-to-face interviews would be both costly and expensive exercise. Structured telephone inquiries had to be made. Among the benefits of obtaining information at a cheaper cost and man hours are: respondents are able to concentrate on voice instead of interviewee’s face; easy rapport; and not being judged or feeling inhibited [58]. Furthermore, Ward et al argued that the telephone should not be relegated to second best status of an information collection instrument on qualitative methodologies. Researchers can instead consider as useful first-choice telephone interviews.

Obtaining information by using the telephone for inquiries provides an efficient means of data collection for both the researcher and the participant [54]. Some researchers have reported various levels of difficulties with regards to acquiring permission to conduct face-to-face interviews, hence researchers need to explore other credible methods of acquiring data [55]. Some researchers have argued that telephone use has been shown to maximize flexibility for scheduling and re-scheduling interviews with interviews [56].

In relation to convenience-related advantages, several studies highlight the methodological strengths of telephone qualitative interviews, such as perceived anonymity, enhanced privacy for participants and decreased diversion (for interviewees) or self-awareness (for interviewees) when interviewees take notes during interviews [57]. Interviewees comment on privacy as a benefit for telephone interviews [58]. Further studies are required to check whether such interview produces wealthy information. Literature has recorded the potential of in-depth telephone interviews offer increased access to geographically distributed interviewees, decreased costs, increased security for interviewees and increased flexibility [59]. Telephone interviews may also require interviewees to be explicit in issues of follow-up rather than depending on non-verbal indications.

Finally, some scholars indicate that in qualitative information collection, telephone interviews may mediate energy dynamics that might otherwise arise in the relationship between researcher and subject. In particular, telephone interviews may be less intrusive than in-person interviews and give interviewees greater power and control over the negotiation of interviews, in accordance with their schedules and the rescheduling of termination of the interview [60].

Questionnaire surveys and face-to-face interviews proved to be difficult, due to the number of provinces that needed to be covered, as well as the number of interviews required. These are sometimes criticized due to dishonesty from respondents and the misunderstanding of questions, while interviews may be manipulated by the interviewer to produce the desired results [61].

The sampling comprised of nine provinces of the Republic of South Africa. Telkom telephonic directory, Internet Google search was used to locate and acquire a list of telephone numbers for the hardware stores. A total of 517 successful calls were made in 2018 totalling 0.001% of the population, per province, as laid out in Table 1.

<table>
<thead>
<tr>
<th>Province</th>
<th>Population (Millions)</th>
<th>Number of Calls</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eastern Cape</td>
<td>6.5</td>
<td>66</td>
</tr>
<tr>
<td>Free State</td>
<td>2.7</td>
<td>27</td>
</tr>
<tr>
<td>Gauteng</td>
<td>12.3</td>
<td>123</td>
</tr>
<tr>
<td>KwaZulu-Natal</td>
<td>10.3</td>
<td>103</td>
</tr>
<tr>
<td>Limpopo</td>
<td>5.4</td>
<td>54</td>
</tr>
<tr>
<td>Mpumalanga</td>
<td>4.0</td>
<td>40</td>
</tr>
<tr>
<td>North West</td>
<td>3.5</td>
<td>35</td>
</tr>
<tr>
<td>Northern Cape</td>
<td>1.1</td>
<td>11</td>
</tr>
<tr>
<td>Western Cape</td>
<td>5.8</td>
<td>58</td>
</tr>
</tbody>
</table>

(Source: Statistics South Africa [62])

Table 1. Number of calls per province with respect to population.

RESULTS AND DISCUSSION

Data collected from the responses was analyzed with SPSS version 25.0 and GraphPad Prism 5.0. The results present the descriptive statistics in the form of graphs, cross tabulations and other figures for the quantitative data that was collected. Inferential techniques include the use of chi square test values, which are interpreted using the p-values. The traditional approach to reporting a result requires a statement of statistical significance. A p-value is generated from a test statistic. A significant result is indicated with “p < 0.05”.

Figure 1. Levels of compliance for building sand per province.

CLAY BRICKS

There are also varying levels of compliance with regards to clay bricks. Limpopo and Northern Cape indicated higher levels of compliance when compared to the average of 6.7%. All provinces do indicate some level of compliance, albeit very low. There are greater variations by provinces that have compliance (not just one as for building sand). This indicates that overall, there was a significant difference in the level of compliance by province. The Figure 2 below illustrates the comparisons by province for the levels of compliance for clay bricks.
CONCRETE BLOCKS

The average level of compliance is 7.3%, with most of the provinces being close to the mean value. The scoring patterns are similar with the chi square test confirming that there is no significant difference by province. The figure below illustrates the comparisons by province for the levels of compliance for concrete blocks.

![Figure 3: Levels of compliance for concrete blocks per province.](image)

CEMENT

Of the various descriptions (item types), cement shows the highest level of compliance (average = 94.8%). The initial chi square tests indicate a significant difference by province. The figure below illustrates the comparisons by province for the levels of compliance for cement.

![Figure 4: Levels of compliance for cement per province.](image)

PROVINCIAL ANALYSIS

The results are also presented by province. This allows for a comparative measure as to the levels of certification between the different descriptive items, namely: building sand, clay bricks, concrete blocks and cement within each province. Cement is by far the most certified with all of the other items having very low levels of certification. There is no need to show p-values here, as all the provinces would be significantly different due to the extremely high levels of certification for cement, and not the other items. P < 0.001 for all provinces when comparing the items within each province.

REGRESSION MODEL

To determine the level of the contribution that the type of item has on compliance, a regression analysis was done. In particular, the effect that the type of description has on compliance is measured using effect size, which is interpreted using a partial eta squared value. A partial eta squared value greater than 0.120 implies a large effect. That is, the type of item does significantly affect the level of compliance. The results observed earlier, which showed that cement had a very high level of compliance when compared to the other products. The province played a small to medium role (partial eta squared = 0.045) in terms of compliance (p = 0.237). This is mainly due to the contribution of Limpopo and Northern Cape. The elimination of these provinces for certain products would reduce the effect size, implying that the levels of compliance were similar, irrespective of the province.

CONCLUSION

As the quality of building materials contributes to defective masonry walling, it is expected that the NHBRC will ensure, during inspection, that all building materials used and workmanship (whether by the home builder or any subcontractor) comply with the Home Builder’s Act and Manual or the National Building Regulations in force at the time, as part of the effort to ensure that the warranty is covered by the building.

The NHBRC advises that the home builder ensures that the materials and workmanship are of the appropriate standard and quality and fit for the intended purpose. Materials of lesser quality than those specified may not be used unless the home-builder agrees in writing. The lack of good quality materials to be readily available on the market, by itself, contributes to the use of building materials that are not SABS or NRCS approved.

This study reached a conclusion that all provinces indicated a low level of building material compliance, namely: building sand, clay bricks and concrete blocks, which can be purchased by housing consumers in compliance with the NHBRC policy. This suggests that although a house is enrolled through the NHBRC residential unit enrolment scheme, it will be difficult for the housing consumer to comply and receive protection. All provinces indicated a high level of SABS or NRCS approved cement usage.

RECOMMENDATION

It is obvious that the higher levels of approved cement used is due to legislation, put in place to ensure that all cement sold to the public is SABS or NRCS approved. It is illegal to sell cement that is not SABS or NRCS approved. There should be no cement sold in SA that does not comply with SANS EN 50197-1. Any of it found should be reported to the Concrete Institute or the Department of Trade & Industries. Similarly, applying the same principle to other building materials, such as building sand, clay bricks and concrete blocks, could make SABS approved products more available to the housing consumer.

This will fulfill the objective of NHBRC with respect to protecting the housing consumer in all respects but not limited to poor quality or substandard building materials.
REFERENCES


MAJOR DEVELOPMENT FEATURES FOR RETIREMENT VILLAGES IN GEORGE, SOUTH AFRICA

ABSTRACT

PURPOSE
As people retire, their need for peace, happiness and security becomes increasingly essential. It will be imperative for developers to create this kind of atmosphere in their retirement villages. By capturing the essence of how retirees think of their homes and lifestyles, a developer can create a competitive advantage over rivals in this industry. The purpose of this article is to highlight the features of a retirement village, using George as a case example.

METHODOLOGY
Descriptive research was conducted to identify the needs and expectations of retirees who wish to reside in a retirement village in George. A case study research strategy, which allowed the collection of data through face-to-face interviews and questionnaire survey was used. Estate agents resident and retirees resident in George constitute the research participants.

FINDINGS
This inquiry produced findings that indicate that a retirement village should offer modern security services, emergency assistance buttons in houses, a clubhouse, beautifully designed buildings and houses, eco-conscious designs, low-maintenance homes, wheelchair-friendly buildings and walkways, Wi-Fi services in all areas, well-nurtured gardens, proximity to shopping centres and CBDs, and pets must be allowed with parks for animals. In addition, retirees expect the effective management of the village, investment security and a care-free lifestyle.

VALUE FOR AUTHORS
The article focuses on the need to pay attention to requirements, features and conditions for a retirement village in George, South Africa. The requirements apply to similar cities in South Africa.

KEYWORDS: Health, Safety and Wellbeing, Real estate, Retirement village, South Africa

1. INTRODUCTION
The population of the Western Cape in South Africa grew at a rate of 2.6 per cent per annum between 2001 and 2011. This rate, which was higher than the national population growth rate of 1.5 per cent, has been attributed to an influx of individuals from other provinces searching for job opportunities. From the statistics contained in the Western Cape Government Provincial Treasury Report, growth can be expected in George primarily because of net immigration into the area by those seeking not only work opportunities and the enjoyable lifestyle that the Garden Route offers, but also an improved lifestyle in terms of safety.

What is not clear are the reasons for the high growth in demand for retirement villages in George. However, assuming that demand will continue to increase, developers of retirement villages will be eager to tap into opportunities in George. Developers can achieve a competitive advantage by meeting the critical success factors regarding the facilities and conditions that most retirees expect from a retirement village. The research problem pertains to the lack of sufficient information about demographic realities regarding an ageing South African population that will increasingly require housing in retirement villages. In addition, insufficient knowledge exists about current international and national trends in retirement villages and the expectations of retirees of future sought-after retirement villages. This information
should aid residential developers in planning and developing sought-after retirement villages in George, South Africa.

This article was based on a study to obtain information about contemporary trends in retirement villages, using a literature review and a survey amongst leading estate agents and retirees currently residing in George. Data obtained through these research methods were analysed and conclusions formulated according to which a Retirement Village Features Model was compiled. The model includes a set of features, conditions and requirements that will increase a developer’s competitiveness in the retirement housing industry in George.

2. RESEARCH PROBLEM AND OBJECTIVES

The researcher was confronted with the problem of insufficient information about contemporary trends in retirement villages, especially in relation to South African context. To address this problem, the objective of the article was to present a set of requirements, features and conditions for a retirement village in George. In this article, therefore, the expectations and needs of retirees residing in George, as well as estate agents actively involved in the retirement village market, were identified regarding facilities, features and conditions of retirement villages in George.

3. REVIEW OF RELATED LITERATURE

A literature review was undertaken in order to explain the popularity of retirement villages and the expectations of retirees regarding the features and facilities of retirement villages.

3.1. The popularity of retirement villages

Retirement villages were aimed at older people who sought to escape from the fast pace of urban life and to live in a warmer climate zone with a vigorous lifestyle. Gated communities are a global phenomenon that has taken root across the globe. Studies about the boom of retirement villages reveal reasons for the popularity of the concept. The reasons include a sense of personal and social identity and a sense of safety, security and belonging, tailored to address the needs of the aged and their declining health and mobility. There is also a belief that retirement villages provide an environment congruent with well-being in later life thus reducing the impact of the ageing process on their welfare. Another reason is the notion that retirement villages provide opportunities for retirees to form new friendships and positive relations.

Also, a Western Cape study by Ravit and Donaldson provides various reasons why retirees choose to live in a retirement village. Some of the ideas have been mentioned above. In particular, the study re-iterates that retirees often stay in retirement villages for:

- Social reasons - knowing that they live in a secure place where no one will harm them;
- Social reasons - knowing there are other people in their surroundings, so they have the possibility of social interaction;
- Economic reasons - knowing that their assets will not be depleted and that they will not lose their homes;
- Health reasons - knowing that when they become frail, they will receive care;
- A sense of belonging and attachment emanating from successful social interactions and feelings of safety and security;
- A sense of security emanating from feelings of satisfaction gained from social support and social order;
- A sense of quality lifestyle was emanating from identifying with the village’s amenities, facilities and services.

3.2. Features and Facilities of Retirement Villages

Developers of retirement villages could emulate their counterparts in developed countries, which ensure that:

- All homes should be designed for wheelchair accessibility throughout, including walk-in showers, adjustable-height work surfaces and parking space for electric wheelchairs.
- Advanced technology must be applied to provide secure facilities, personal alarms, monitoring and smart home capability as well as modern communication facilities such as movement monitors, webcams and broadband.
- A village centre should be a necessity of providing a meeting place with facilities for leisure, entertainment and education. It should include a fitness suite with gym and sauna and swimming pool, a restaurant, a café serving tea, coffee and light snacks, a library, a shop, an internet facility, a village hall and a bar serving alcoholic drinks.
- The whole development should be set in excellent, well-maintained gardens. The external environment must be well designed for pedestrians and electric wheelchairs.
- Emphasis should be put on the full package of safety and security facilities, equipment and services.
- A mixture of tenure should be available including some properties for sale on freehold and others on leasehold terms, with leasehold properties cross-subsidising public infrastructural services and operational costs not covered by levies.
- There should be a relationship among residents, and management body, which draws on the experience of residents and gives them a voice in decisions about how the community operates, including a democratically elected residents’ body to which managers can relate.
- In future, consideration should be given to inviting the public to access the village centre, without jeopardising security and safety, to optimise the use of the facilities, thereby contributing to their economic viability.

In addition to the above, it is vital for developers to be mindful of the changing needs of residents as they grow older to enable them to age without any further relocation outside the village. Certain authors perceive that retirement villages should:

1. have different affordable housing options;
2. have expanding healthcare services;
3. address technology needs; and
4. have growing wellness and lifelong learning initiatives by partnering with organisations, including universities and active adult communities. The four attributes are explained succinctly as follows.

3.3. The future health and wellness facilities

Future, first-class, health and wellness facilities will continue to be an essential feature for retirement villages. Retirees will be well acquainted with spas and alternative relaxation modalities available in the community, and they will want to access these services conveniently either on-site or in a village nearby. Susan et al. conclude that, although some communities have developed or upgraded on-site spas and salons, most villages do not yet have the same ambience and consumer comforts of premier establishments in the external community. Wellness centres have been developed from being merely a suite of physicians’ offices, where residents can get their blood pressure checked and receive their annual flu shots, into full-scale fitness centres that include swimming pools, jacuzzis, well-equipped exercise rooms with personal trainers, massage therapy tables and locker rooms. The movement away from the traditional healthcare design within retirement villages, characterised by double-loaded corridors and large, fixed nursing stations has changed most significantly over the past few years. The literature states that faced with an ageing population, rates of dementia are expected to double every 20 years for the next several decades, with an estimated number of cases worldwide reaching 81 million by 2040. Hence, specialised care for dementia or memory support is an essential area of growth in both the assisted living and nursing-home setting.

3.4. Future lifelong learning programmes (LLP)

LLP and connections to colleges and universities are also a growing trend. According to their survey conducted amongst retirees in a large number of retirement villages, more than one-quarter indicated that they collaborated with colleges and universities by working together on projects.

3.5. Need for a healthier living environment

There is a growing movement among older adults who are living in retirement villages to focus greater attention on their situations. These environmental concerns result in positive changes for themselves, the other members of the town and for the community itself. Retirees are increasingly becoming advocates of healthier living environments and are addressing their concerns in co-operation with developers and managing agencies to transform the status quo into a more sustainable form of living. The literature indicates that more and more elderly adults are looking for senior living communities that reflect their lifestyles and values. Such communities require a complete and integrated process that balances all aspects of the living conditions. The living conditions shape environmentally sound use of community resources, energy efficiency, waste management, a variety of building-specific techniques, as well as a range of services and programmes. Green walkways will increasingly become a necessity for retirement villages. Green walkways facilitate regular walking by retirees that offer benefits including increased socialisation, improved self-esteem and better health. Daily physical activity is essential for the primary and secondary prevention of many chronic diseases (e.g. coronary heart disease), disabling conditions (e.g. osteoporosis and arthritis), aiding in weight loss and preventing weight gain.

In summary, the retirement segment of the housing industry in George is a business growth area. The literature reviewed supports the perception that developers of retirement villages in the area can achieve competitive advantage by focusing on four pillars, namely: efficiency, quality, innovation and customer satisfaction. It is essential that different housing and retirement services and amenities on offer in retirement villages enhance the lifestyle preferences of today’s seniors.
4. RESEARCH METHOD

Following the research guidelines, George was chosen for a case study of a city in South Africa. George was chosen due to continued population growth as a result of net immigration because of work opportunities and safe lifestyle. Descriptive research was conducted to identify the needs and expectations of retirees who wish to reside in a retirement village in George. Based on the results of the empirical study, a model of critical features, conditions and requirements was developed inductively to describe the elements of future, retirement villages in George, South Africa. The qualitative research was undertaken by collecting primary data through interviews with estate agents in the retirement housing sector based in George. Data were also obtained from a questionnaire survey of four estate agents active in the retirement housing market in George and 115 retirees residing in existing security villages in George. The case-based method thus collected data through multiple techniques (interview and survey questionnaire). The retirees were between the ages of 50 and 70 years old. The researcher implemented certain steps to address the ethical challenges of the research. In particular, participants were informed about the researcher, the purpose of the survey and intended usage of the information. The 115 retirees in the survey were randomly selected volunteers from whom written consent was obtained before the completion of the questionnaires and the four Estate agents participated voluntary and fully informed about the purpose of the survey. The privacy of participants was respected and all arrangements for their completion of the questionnaires and collection thereafter were made with the consent of the participants. The participants were assured of their anonymity and the confidentiality of the responses provided in the completed questionnaires. More importantly, the researcher obtained the permission from the University’s Ethics Committee to conduct the questionnaire survey.

The primary variables in the semi-structured questionnaire were informed by the findings of the literature reviewed, which outlined the expectation of retirees residing in retirement villages. The expectations included: opportunities for social interaction; security and protection; a free and comfortable lifestyle; economic security; recreational leisure facilities; well-designed houses and buildings located close to shopping centres; privacy; effective management of the village; well-nurtured gardens; paved walkways; wheelchair-friendly access; low-maintenance housing; solace in successful ageing; and green design of the village.

The responses of the participants to the questionnaire were analysed statistically, and the authors derived the findings from the results that are presented in the next section. The research process unfolded with conducted interviews with four estate agents actively involved in the retirement housing sector in George. The interviews addressed the importance of possible features of retirement villages in George. The next step of the process developed a draft questionnaire and conducted a pilot survey with 30, randomly selected, retirees in George. The responses received were analysed, and the questionnaire was amended and finalised. The final questionnaire was distributed amongst 115, randomly selected, residents residing in existing security villages in George. The researcher used three assistants from the participating residential villages and, after training them in the process to be followed, arranged for them to distribute the questionnaires door to door, explain the questionnaire and collect those that had been completed after three days. The questionnaire included the written consent of all respondents to participate in the survey. With the help of the assistants, individuals who had not completed the questionnaire within the three (3) days were followed up, and the assistants then interviewed the respondents in order to complete the surveys.

5. RESULTS AND INTERPRETATIONS

The demographic data from 115 retirees showed that the responses reflected the perceptions of approximately the same proportion of men (50.4%) as women (49.6%). Nearly two-thirds of the participants (64.4%) were between 65-70 years of age while 23.48% were between 60 and 65 years old. Only 12.18% of the participants were between 50 and 59 years of age. The data showed that 82.6% of the participants were married, and the majority (63.5%) had less than four years of permanent residence in a retirement village. Approximately the same number of participants lived within 500 kilometres of their family (51.3%) as those who lived more than 500 km away from their family members (48.7). The results showed that 58.26% of the participants made efforts to become acquainted with others in the village, while 51.21% participated in village activities, and only 46.96% made friends with others in the village. Since 71.3% of the participants made nine or more visits to town per month, it could be concluded that participants would expect future retirement villages to be located close to city centres and shopping centres. With the vast majority of participants making use of recreational facilities outside the village (71.3%), it could be expected that recreational facilities within future retirement villages might be regarded as being optional rather than a necessity.

The percentages of participants who rated possible features of future, retirement villages as very important (value four on the scale) and as of utmost importance (value five on the scale) were combined, and the ratings were then ranked from highest to lowest as shown in Table 1.

<table>
<thead>
<tr>
<th>Question</th>
<th>Feature</th>
<th>Total Score (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>D1</td>
<td>Modern security facilities</td>
<td>85.2</td>
</tr>
<tr>
<td>D2</td>
<td>Emergency buttons in houses</td>
<td>84.4</td>
</tr>
<tr>
<td>D3</td>
<td>A clubhouse</td>
<td>84.4</td>
</tr>
<tr>
<td>D19</td>
<td>At least one lock-up garage</td>
<td>80.9</td>
</tr>
<tr>
<td>D22</td>
<td>Eco-conscious design</td>
<td>78.3</td>
</tr>
<tr>
<td>D21</td>
<td>Low-maintenance houses</td>
<td>76.5</td>
</tr>
<tr>
<td>D18</td>
<td>Wheelchair-friendly buildings</td>
<td>65.2</td>
</tr>
<tr>
<td>D9</td>
<td>WI-FI services in all areas</td>
<td>64.4</td>
</tr>
<tr>
<td>D11</td>
<td>Well-nurtured gardens</td>
<td>60.9</td>
</tr>
<tr>
<td>D17</td>
<td>Scheduled shuttle services</td>
<td>41.7</td>
</tr>
<tr>
<td>D6</td>
<td>Restaurant delivery meals</td>
<td>40.9</td>
</tr>
<tr>
<td>D20</td>
<td>Pets allowed</td>
<td>40.0</td>
</tr>
<tr>
<td>D5</td>
<td>Restaurant</td>
<td>34.8</td>
</tr>
<tr>
<td>D4</td>
<td>Coffee shop</td>
<td>31.3</td>
</tr>
<tr>
<td>D7</td>
<td>Leisure room with games</td>
<td>29.6</td>
</tr>
<tr>
<td>D8</td>
<td>Library with computer</td>
<td>26.1</td>
</tr>
<tr>
<td>D10</td>
<td>Hair and beauty parlour</td>
<td>25.2</td>
</tr>
<tr>
<td>D12</td>
<td>Fully-equipped gym</td>
<td>18.3</td>
</tr>
<tr>
<td>D16</td>
<td>Play park for animals</td>
<td>18.3</td>
</tr>
<tr>
<td>D13</td>
<td>Swimming pool</td>
<td>16.5</td>
</tr>
<tr>
<td>D15</td>
<td>Play park for children</td>
<td>13.0</td>
</tr>
</tbody>
</table>

From Table 1, it is evident that there were nine (9) features regarded by between 60% and 86% of the participants as being very important or of utmost importance. The features included: modern security services, emergency buttons at houses, a clubhouse, at least one lock-up garage, eco-conscious design, low-maintenance houses, wheelchair-friendly buildings, WI-FI services in all areas and well-nurtured gardens.

As indicated in the methodology section, the survey data were supplemented with responses from estate agents that were familiar with the features of retirement villages in George. The researcher selected four estate agents in George with extensive knowledge and experience in buying and selling retirement homes. The agents were very well informed about retirees’ expectations of retirement villages in George. The combined ratings of the agents were analysed and presented as percentages in Table 2. The features rated by the agents as being the top three were: new security, assisted living and frail care.

Source: Authors’ compilation
Table 2: The essential features of future retirement villages rated by estate agents

<table>
<thead>
<tr>
<th>Question</th>
<th>Feature</th>
<th>Total Score (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>D1</td>
<td>Modern security</td>
<td>76.0</td>
</tr>
<tr>
<td>D23</td>
<td>Assisted living</td>
<td>76.0</td>
</tr>
<tr>
<td>D24</td>
<td>Frail Care</td>
<td>76.0</td>
</tr>
<tr>
<td>D2</td>
<td>Emergency buttons in homes</td>
<td>68.0</td>
</tr>
<tr>
<td>D11</td>
<td>Nurtured gardens</td>
<td>68.0</td>
</tr>
<tr>
<td>D19</td>
<td>Eco-conscious design</td>
<td>64.0</td>
</tr>
<tr>
<td>D16</td>
<td>WI-FI</td>
<td>64.0</td>
</tr>
<tr>
<td>D18</td>
<td>Wheelchair friendly</td>
<td>64.0</td>
</tr>
<tr>
<td>D20</td>
<td>Pets allowed</td>
<td>64.0</td>
</tr>
<tr>
<td>D21</td>
<td>Low-maintenance homes</td>
<td>64.0</td>
</tr>
</tbody>
</table>

Source: Authors’ compilation

The four estate agents were also requested to identify the types of accommodation retirees prefer in retirement villages. The agents identified the following types of accommodation in order of market preference:

- Privately owned homes with two bedrooms.
- Privately owned homes with three bedrooms.
- Privately owned homes with one bedroom.

Accordingly, in this study, features that were mandatory and optional were established based on the perceptions of estate agents and the users of the units in retirement villages.

5.1. Mandatory Features Expected in a Retirement Village

Figure 1 illustrates the features, facilities and conditions that were found to be critical success factors for future retirement villages. Based on the preferences expressed by the participants in the survey, a retirement housing portfolio must have at least one lock-up garage for each unit. More than half of the participants (52%) preferred to own a two-bedroomed unit, while 33% preferred a three-bedroomed unit. Only a minority mentioned a preference for a one-bedroomed unit (7%) and 8% of them to rent either a one-bedroomed or two-bedroomed unit instead of taking up ownership.

Concerning infrastructure, the participants outlined the need for modern security services including perimeter palisade fencing, and a security gate manned 24 hours, strict access control and foot patrol by guards. The village should also have an emergency assistance button in each house, emergency response services, and wheelchair-friendly walkways and facilities. Besides having beautifully designed buildings that promote privacy, the participants were also keen on a clubhouse with kitchen, catering and braai facilities. Other facilities mentioned by the participants included:

- Eco-conscious design such as solar-powered geysers and rainwater tanks;
- Low-maintenance homes constructed with high-quality face bricks, roof tiles and aluminium windows;
- WI-FI services in all areas;
- Well-nurtured gardens, water ponds and paved walkways;
- Shopping centres, medical facilities, restaurants close by;
- Pets allowed with a park where animals can be taken to (for animals).
The results emphasised the need for specific services and conditions required in a retirement village. Effective management of the village was a top priority to ensure it is well maintained and that all rules and regulations are followed for clean living. The economic investment follows from the effective control of the village. In this context, financial investment refers to security whereby the retirement village offers value for money compared with other retirement villages in George, ensuring affordable levies and offering a market-related purchase price that creates an opportunity for good investment returns. Another essential condition in a retirement village is a care-free lifestyle where residents feel safe to walk around, relax in pleasant surroundings with paved walkways and enjoy the village lifestyle. The findings of the study also support the notion that retirement villages should provide platforms for graceful ageing through assisted living services with staff and support programmes helping residents with daily living and primary care. In this context, frail-care services and facilities for residents requiring 24-hour nursing are mandatory.

5.2. Optional Features Expected in a Retirement Village

From the responses to this study, it was found that not all the features highlighted in Figure 1 above are mandatory. From the literature review, it appeared that contemporary trends were for retirement villages to provide a full portfolio of facilities and services on site such as a restaurant, coffee shop, hair and beauty parlour, fully-equipped gym and spa. From the responses to the survey, the participants did not regard the restaurant, coffee shop, hair and beauty parlour, scheduled shuttle service, fully-equipped gym, library and swimming pool as being of high importance in a retirement centre.

From the interviews conducted with the four leading estate agents in George, it was evident that excessive levies being charged was the primary concern of retirees living in retirement villages. Should the maintenance costs of facilities such as restaurants, coffee shops, beauty parlours and other amenities form part of the calculation of levies, then retirees expressed great concern and hence their lack of eagerness to regard these features as being necessary for a retirement village. However, there were suggestions that these facilities should be developed on site to provide ease of access for residents of retirement villages, but that the facilities should be operated and managed by the private sector, and the user charge principle would apply, with special fees and rates negotiated for residents of the retirement village.

5.3. How management of retirement villages can attract retirees

In response to what the management of a retirement village can do to attract people to the gated communities, the above results show that retirees favour two to three bedroom privately owned houses in villages in George. Empirical studies from Australia show that the structures of the independent living units (in the case of this study the structure is two to three bedroom apartments) and the retirement village characteristics were strictly related to pricing, which should influence the marketing of the villages by appropriate management.

As opposed to excessive security apparatus, the living environments of retirees in the form of frail care and assisted living should be emphasised in the villages. These two points (a type of housing and living environment) constitute a vital marketing point in the hands of the management of retirement villages in the Cape region of South Africa. The argument reinforces the suggestion by Sporcor who observe that in the retirement gated communities in non-metropolitan Western Cape (towns such as Oudtshoorn and Swellendam), retirees have chosen to reside in secure villages because of certain pull factors that appeal to them. Furthermore, contrary to the widely held belief, the study revealed that security is not the leading reason retirees choose to reside in gated communities.

In essence, as a viable housing option for older people, retirement villages need to provide a sustainable living environment that satisfies residents’ needs. Levy’s (2000) study determined that the factors that will help managers of villages to increase their clientele include modern safety and security facilities, emergency assistance button in houses linked to emergency response services, clubhouse with kitchen, catering and braai facilities, beautifully designed buildings and houses, eco-conscious design, low maintenance homes, wheelchair friendly buildings and walkways, Wi-Fi services in all areas, well-nurtured gardens, water ponds and paved walkways, pets allowed with park for animals and proximity to shopping centres, medical facilities, restaurants. The provision of a living environment that incorporates the above facilities will help managers of retirement villages to evolve competitive advantages in the market. The provision of the sought after living environment is vital to the retention of existing retirees in the community and the attraction of new retirees to the community since empirical evidence revealed that retirees are likely to own the retirement home that could support their overall health and well-being within a safe and supportive senior-friendly location, apart from the fact that they tend to reside in the retirement home that is served with good access to amenities.

6. FUTURE RESEARCH

In this article, the most critical features and conditions that a developer should consider when planning and developing a future retirement village in George, South Africa are described. The participants in this study were limited to estate agents currently operating in George and retirees presently residing in George. It is recommended that future primary research regarding retirement villages should be extended to include other regions in South Africa so that results comparable with those from this study can be obtained elsewhere. Future studies should be pragmatic inquiries that interrogate how facilities with direct levy implications, such as restaurants, gyms, and beauty parlours can be included within the boundaries of retirement villages but are operated and managed on a commercially outsourced basis. It is recommended further that options be explored for how retirement villages can provide assisted living and frail-care facilities while operated and managed on a commercially outsourced basis.

It is also recommended that future research be conducted on how to commercialise facilities and services such as a scheduled shuttle service, restaurant, coffee shop, hair and beauty parlour, gym, spa and swimming pool within the boundaries of retirement villages so that they have low or no cost implications that need to be absorbed into the levies of residences. Alternatively, options should be researched on how to provide for most of the above facilities in commercially operated complexes operated by the private sector with access to the public without compromising the safety and security of the village while residents could be using the facilities on a discounted, user pay principle.

7. CONCLUSIONS

The research recorded in this article addressed the problem of insufficient knowledge being available about present-day trends in retirement villages and the expectations of retirees who are keen to live in such communities. The objective of the study was to develop a set of features and conditions for a retirement village in George.

Therefore, the expectations and requirements of retirees residing in George regarding the facilities, features and conditions of future retirement villages in George were identified in this study. The research process involved the findings of a literature review that were used to expedite a successful questionnaire survey that was conducted amongst four experienced and knowledgeable estate agents actively involved in the retirement housing market in George as well as 115 selected retirees between the ages of 50 and 70 residing in secured retirement villages in George.

The above discourse provides information on the increased need for retirement villages that can meet the expectations of retirees who long for a secure environment with opportunities for social interaction and quality lifestyle. Based on empirical data, the most important expectations of retirees regarding features, facilities and conditions of future, retirement villages in George were recorded. The features included: safety and security, opportunities for social interaction, and well-designed, low-maintenance housing units with appropriately nurtured gardens. It was noted that the options for retirement housing preferred by retirees were privately owned, two- or three-bedroom homes with a garage. The study reinforced the importance of access to frail care and assisted living facilities for the residents of such villages.

Developers in the Western Cape and South Africa, in general, should be mindful of the specific needs of retirees before a project is conceptualised. The description of the significant features of retirement villages provides a framework for the future design of such villages. The research determine the most important features and conditions that a developer should consider when in future a retirement village is planned and developed in George, South Africa. The primary research was limited to estate agents currently operating in George and retirees currently residing in George as participants in the survey. It is recommended that future primary research regarding retirement villages should be extended to include other regions in South Africa so that comparable results to these studies may be obtained elsewhere.

NOTE: The rules of the MBA study that produced this article allowed references within five years. Most of the cited references above were published between 2012 and 2018. The MBA was submitted in 2017.
8. REFERENCES


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Title page (page 1): The first page of the manuscript must contain a concise and informative title, a secondary running title of not more than 75 characters and spaces, the name(s), the affiliation(s) and address(es) of the author(s) and the name, address, telephone, fax and email of the author who will be responsible for correspondence and corrections. The title should be in 12pt bold capitals, the name(s) of the author(s) in 10pt bold upper and lower case and the affiliation(s) and address(es) in 10pt upper and lower case with a single line space between each.
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What are the reason(s) for writing the paper or the aims of the research?

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If research is reported on in the paper this section must be completed and should include suggestions for future research and any identified limitations in the research process.

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What is original/value of paper?
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Introduction (page 3): The introduction should clearly state the purpose (aims and objectives) of the paper. It should include key references to appropriate work, but is NOT the place for a comprehensive historical or literature review.
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The table identification should be in bold. Identify all statistical methods and sources of data.

The tables should only have horizontal lines, the heading and bottom lines being in bold.

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Table 1 Components of expenditure

<table>
<thead>
<tr>
<th>Component</th>
<th>Expenditure (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cleaning works</td>
<td>40.9</td>
</tr>
<tr>
<td>Mechanical services</td>
<td>37.7</td>
</tr>
<tr>
<td>Building works</td>
<td>13.6</td>
</tr>
<tr>
<td>Civil works</td>
<td>7.8</td>
</tr>
<tr>
<td>Total</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Source 1

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