Effects of Poor Specification Writing on the Operational Cost of a Building: A Case Study of Student Residency in Covenant University, Ogun State

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ABSTRACT

This paper seeks to examine the possibility of poor specification writing during the design stage for student residency within Covenant University, Ogun state, with its impact on the operational cost on the various buildings. In doing so, the study begins with the review of relevant literature on the concept of specification writing at the design stage and its possible effect on the operational cost of buildings. Also, other factors that contribute to the high operational cost in student residency such as installation and maintenance procedures are discussed herein. Interviews were conducted with facility managers and practising professionals in the construction industry to obtain professional insight and proficiencies that were used as data for this research. The paper concludes with identifying poor specification writing as a major factor for high operational cost in student residency throughout its life cycle. Recommendations are given to curb the rise of operational cost in buildings.

Keywords: Specification writing, poor specification writing, operational cost, student residency

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1. BACKGROUND TO THE STUDY

The term "specification" generally applies to all instructions, demands, and provisions related to the work and its payments, a description of what is required (CDOT, 2018). In building construction, a specification refers to a document of written requirements to be fulfilled in terms of materials, procedure, quality, service, size, cost and timeframe (Haruna I. A., 2006). Poor specification writing is a type of specification writing which results due to an incorrect description of the type of material to be used, the quality of the material and the workmanship (the installation procedure) to be used for the material. This type of specification occurs in instances where the basic guidelines to be followed in the writing of a specification document is not adhered to. Life cycle cost analysis is an important economic factor of a building, it helps in evaluating the cost of a building from the design stage to the hand – over stage and also throughout the life cycle of the building. It considers various types of costs involved in the construction and facility management of the building including costs of planning, design, acquisition, operation, maintenance and disposal, less any residual value. It can also be referred to as the cost of ownership. (Sieglinde, 2016; Jemima, 2012). The cost incurred during the day to day management of operational facilities is known as operational cost.

2. STATEMENT OF PROBLEM

Specification writing has been proven to be the second most prominent factor that contributes to the increase in building operational cost (Oladunni, Ekhaese, and Ayo-Vaughn, 2018). This is a function of material, fittings and fixtures that make up the components of the building.

The paper focused on the identification of the effect of poor specification writing on the operational cost of student residency buildings in Covenant University, Ota, Ogun state. To achieve the above aim, the following research questions were answered:

- What are the factors that constitute poor specification writing?
- What are the factors that affect the operational cost of the building?
- How can the effects of poor specification writing affect the operational cost of the building?

3. OBJECTIVE

The objectives of this research are: to identify the factors that constitute poor specification writing; to examine factors that affect the operational cost of the building and to investigate the effects of poor specification writing affect the operational cost of the building.
Following the review of several articles related to the focus of this paper, it was observed that there has been limited work focusing on the influence of specification writing in the construction industry. According to Krstic & Marenjak, 2012; Krstic & Marenjak, 2017, it has been deduced that operational cost of a building has contributed to the highest percentage of cost in the lifecycle cost of the building. Hence, this paper seeks to study the possible relationship between specification writing and the operational cost of a building and how this affects the life cycle cost of the building.

4. METHODOLOGY

4.1 The Research Design

This section of the project examines in explicit detail the method of explaining the project further. It investigates a settings internal and complex dynamics, the relationship between a settings components part and also all elements, relationship among elements, development of the complex and contextual influences. The methodology used for this research is Qualitative Research Methodology. This is the verbal data i.e. information gathered and analysed in a descriptive manner, subjective, impressionistic or diagnostic.

The study area is limited to Covenant University, Sango Ota, Ogun state, Nigeria. The scope of the study is limited to facilities reserved for student residencies.

5. DATA PRESENTATION

From interview

Some professionals in the construction industry, facility managers and users of the building were interviewed. This consisted of two architects who have worked in Covenant University's Physical Planning Development (CUPPD); two facility managers and students who reside in the undergraduate and postgraduate halls of residence.

5.1 Interviews with architects

The first interviewee is a practising architect, also a past CUPPD director with about 10 years of architectural practice post qualification. Out of his 10 years of practising, he was the Lead Architect on the Post-Graduate Halls of Residence, in charge of design, project supervision and project management). According to him, the factors considered during the specification writing for the project include; building type, client's anticipated quality level, and moderate maintenance cost. In the specification document, items installation procedures and maintenance instruction of building items were not included. During construction, the rule of thumb method was used for the installation of building items. In his professional opinion, he believes specification writing has an effect on the operational cost of the building. He emphasized it helps to remove ambiguity in implementing given instructions, which can lead to costly decisions that can impact on the operational cost of the building.

The second interviewee is a lecturer at Covenant University. He is a certified Autodesk instructor and has about 7 years of architectural practice post qualification. He was part of the design team that worked on the undergraduate halls in Covenant University. He designed, detailed and supervised 4 no of 300 room student hall of residence. In the design for the student hostel, he considered materials that were relatively easy to maintain and are durable, with proper consideration of the brief. However, he further stated that during the construction, some of the specified components were not readily available at the required time so there had to be some replacements. Although a specification document was provided for the buildings, the type used on the project were not the formally written ones, they were more informal and less detailed; therefore, cannot pass as a contract document. Therefore, they cannot be used in maintaining the building. Also, a maintenance manual was not prepared for the buildings.

5.2 Interviews with facility managers of the relevant structures

The facility managers of both the postgraduate halls and the undergraduate halls are in charge of the regular maintenance and day to operations of their respective hostels. The facility manager for the undergraduate hall informed us that the students rarely complain about the facilities in their hostels, however, the most complaints come from the carpentry works within the room, such as their lockers, and doors. She also stated that the reduced complaints in the buildings could be as a result of the regular preventive maintenance measures carried out at certain intervals. In spite of all preventive measures taken, she also opined that corrective maintenance is inevitable.

The facility manager for the postgraduate hall stated that he had not received a specification document to guide maintenance of the building. He also stated that corrective maintenance in the building was a common occurrence. He grouped the corrective maintenance into three aspects; the technical aspect that deals with diagnosing the problems of the building, the administrative aspect that deals with controlling the staff and the managerial aspect that deals with handling the materials and equipment provided. When asked the reason for this, he stated that the issue stemmed from time, in the sense that many structures in the university were done at a quick pace, resulting in insufficient attention given to minor and major faults that arose during the Defect Liability Period (DLP).

5.3 Interviews with users of the relevant structures

The interviews of users from both the undergraduate and postgraduate hall were carried out to determine the need for maintenance in cases of plumbing, carpentry, electrical and other features present in the hostels, the speed and frequency of maintenance and the maintenance culture. For this study, a total of twenty users were interviewed. When questioned about plumbing maintenance issues, most undergraduate respondents did not have much to say on the issue, although the respondents from the postgraduate hall stated quite a number of problems with the plumbing. Issues due to piping has led to leaking from heating pipes, that stain the walls and leaking from air conditioning units that do the same in rooms, besides leaking the respondents stated how some fixtures like taps on the sink or in the showers are either missing or do not function. In some toilets, the entire shower fixture had one to multiple issues from broken or detached privacy glass to privacy glasses that do not close, to drains that do not drain to shower heads that leak. Some toilets were missing extra fittings like towel racks, mirror lights.

For issues pertaining to electrical problems, respondents from the undergraduate halls stated that their cause for maintenance originated from this building service. As for the respondents of the postgraduate hall, their responses were more specific stating that lighting points not having working bulbs. The respondents also pointed out the need for ceiling fans to be serviced and air conditioning units that did not cool the rooms when turned on. Issues with sockets been damaged were also reported.

In the next section of the interview, the respondents were asked about issues with carpentry. Respondents from the undergraduate hall stated to have issues with carpentry especially their doors, and how easily it gets damaged due to loss of keys. For the postgraduate respondents, issues with doors, windows, wardrobes and chairs. The issues relating to the windows that were stated ranged from broken or frozen hinges of casement windows to sliding windows that do not slide due to debris from construction filling up the panels to torn safety net. For the door, the respondents stated that damage was made to areas where the door jambs met the door frames. With issues relating to wardrobes, full-length mirrors were missing, some without the entire door for the wardrobe. Some respondents stated that the number of chairs and tables provided for each room not enough and that some of the furniture provided was damaged.

The respondents also talked about other maintenance problems like ceiling finish not being installed properly making it subject to removal during storms or just heavy winds. Other rooms had issues with the leaking ceilings, but most respondents had issues with pests that entered the rooms through holes and openings in the toilets. In the final section of the interview, respondents were required to rate the frequency of maintenance and the maintenance culture exhibited. Most of the undergraduate respondents rated the frequency of maintenance and maintenance culture as fair; however, the postgraduate respondents rated the frequency of maintenance and maintenance culture as poor.

6. DISCUSSION OF FINDINGS

The different aspects of poor specification in both halls of residence.

The undergraduate hall

- From observation, the halls seem to have adequate finishes specified and the users were considered in the design. For instance in the male hall of residence, due to continuous damage to the wooden doors in the hall, an entirely new metal door was provided and this led to a reduction in the operational cost of those halls.
- Due to the absence of specified maintenance procedures, the maintenance carried out does not follow any scheduled format. The maintenance work occurs as faults are noticed, making corrective maintenance frequently done.

6.1 The Postgraduate Hall

- From the interviews carried out with the users of the postgraduate halls, it is evident that the halls are in dire need of proper maintenance. In addition, the frequency of complaints made by the students especially with regards to plumbing infers that the operational cost of the building would be high if proper maintenance procedure is carried out.
- The halls used many technological advanced components, in comparison with the component used in other building in the school. These components such as the key-card door being used for the rooms. These components require a maintenance manual or schedule because the facility managers are unfamiliar with its operations. Unfortunately, this was not provided.
- Due to the lack of maintenance manual, the facility managers do not follow a process of maintenance which leads to regular, incorrect maintenance, which ultimately results in the gradual deterioration of these components. For example, the key card door as stated earlier rarely works with the provided key cards, this is because when accidents occur, the students are asked to open the doors using a screwdriver. The consistent use of screwdrivers on these doors has greatly reduced its capacity as some no longer function properly.
- In addition, the lack of stated installation process in the provided specification documents leads to the incorrect installation of building components, which causes the need for constant maintenance, thereby increasing the operational cost significantly. For example, due to incessant complaints from residents on the third floor of the building, concerning the leaking roof, several attempts have been made to fix this problem but it keeps reoccurring due to the initial incorrect installation of the roofing system. This need for reoccurring maintenance increases the operational cost of the building significantly.
- The lack of stated installation process has also contributed to plumbing issues causing water seepage through the floors, which can damage floors and reinforcements within the support system.
- Another issue that results from lack of installation procedure is the leaking of air conditioning units, due to miscommunication between the subcontractors responsible for installing the pipes used to manage the air conditioning units and the units themselves.

7. CONCLUDING REMARKS

In order to minimize the operating cost of student residency buildings proper specification outlining the installation procedure, materials required and maintenance procedure must be provided during the design and followed meticulously through the construction.

8. CONTRIBUTIONS TO KNOWLEDGE

Below are some basic guidelines to prevent poor specification writing (Brooks, 2018):

- Good Specification writing should be edited to reflect the chosen procurement route.
- Specification writing should always begin from a solid baseline document. The mistake of taking the specification document of a previous project done and editing it for the current project should be avoided, because it leads to mistakes like specifying a wrong material, naming an incorrect project and a list of other basic errors.
- The term ‘or similar approved’ in a good specification writing should be avoided. This is due to the fact that if you approve it, you are in turn assuming liability for it. This can be avoided by using the term ‘or acceptable equivalent’. The accepting of an alternative moves the Fitness for Purpose responsibility to the contractor, thereby restricting the architects’ acceptance to design intent.
- Defined terms should be used at all times in good specification writing.

- Names of individuals or persons should be omitted when products are being specified. Rather, the company's should be provided.
- An identification of the document or the section should be included in the footer of every page for the purpose of document control.
- Particular clauses in a document should not be highlighted by using bold or underlining because this makes it seem that the clause is of particular importance. This should be avoided because such a thing does not exist in a specification writing, as it by default indicates that all other clauses are not so important.
- The putting of specification clause numbers in drawings should be avoided. Instead, it is recommended that product reference codes be used which should also be included on a technical reference sheet (T – sheet) that provides a link between the drawings and the specifications.
- Specification of temporary works should be avoided, as this is the responsibility of the contractor.
- Adequate time should always be set out for the specification document to be proofread.

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