PERCEPTION OF BUILDERS' DOCUMENTS AS CONTRACT DOCUMENTS AND THE IMPERATIVES FOR THEIR USE IN NIGERIA

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Abstract

Contract documents do not only represent ethical norms, they also serve as terms of reference for any construction work. This paper appraises the Builders documents as they form part of the contract document in accordance with the Nigerian National Building Code. It shows how the Construction Programme synthesizes the construction activities of a building project to give a suitable level of production flow and optimize the use of resources. The paper further depicts how the Quality Management Plan results in the reduction in inefficiencies and waste with the subsequent improvement in work practices of any given project. It also portrays how the Health and Safety Plan provides an organization with a proactive medium related to hazards and accidents thus fostering such organization to continue operating a profitable business while protecting employees from injuries, illness or harm. The perception of the built environment professionals were also sought to substantiate information from literature. This was done through the administration of structured questionnaires to inquire about the professionals' awareness about the documents, the extent of their application in execution of building projects and whether or not they should continue to be part of contract documents. The study revealed that some professionals are still not aware of their existence, of those that are aware of the existence of the Builders documents, some still do not use any of them in projects executions but most of the respondents are in support of inclusion of the Builders documents as contract documents. In conclusion, the writers emphasized the necessity of construction professionals and stakeholders to strongly adhere to the use of The Builders documents as contract documents so that construction delivery will be more efficient, safer and on time.

Key Words: Builders" Documents, Contract Documents. Construction Programme, Project Quality Management Plan and Project Health and Safety Plan.

Background

The fact that the construction industry is rapidly advancing and becoming more competitive puts professionals under constant pressure to produce buildings that are able to perform their best in any given condition. In today's ever complex built environment, professionals and/or team-players have a lot of stake to harness all resources and optimize quality, time and above all, cost (Shah, 2004). For the efficient production of buildings, standardized documents are needed but they must be articulated by professionals who are capable of seeing the bigger picture. It is important for team players in the construction industry to have an understanding of the Builder's documents because they are designed to standardize processes, minimize wastes and reworking, and increase profit. Due to these, it becomes imperative to identify the benefits derivable from efficient use of such documents in projects.

Since 2006, the Nigerian construction sector has been going through a radical change driven by the emergence of the National Building Code. Section 2.32 of the National Building Code clearly spells out that the Project Quality Management Plan, the Project Health and Safety Plan and the Construction Programme shall form part of the contract documents and shall be prepared by a registered Builder. As such, this necessitates the need for a thorough appreciation of such documents by professionals and team players alike in the construction industry. In view of this the study assessed the perception of the building professionals on the imperatives and usage of the builders' documents.

Contract Documents

All construction projects must have contract documents because they do not only represent ethical norms; they also serve as terms of reference for the works. The contract document defines exactly and explicitly the rights and obligation of every party involved. Murdoch and Hughes (2006) assert that contract documents consist of:

Drawings and specifications: Drawings are the vehicles by which the designer's intentions are conveyed. They provide information about the shape, appearance, and location of the various components while specifications spell out the quality of finishes and workmanship to be employed amongst other items.

The Bill of Quantities: These provide the basic cost data of the designs and specifications. Also, they play a vital role in valuation of variations amongst others. The Conditions of Contract: These are detailed clauses which amplify and explain the basic obligations of the parties involved in the contract. They also provide administrative mechanisms for ensuring that the correct procedures are observed which will have otherwise been breaches of contract thus ensuring that the contract is kept alive.

Nunnally (2007) stated that a construction contract consists of the following documents;

a. Agreement; The agreement describes the work to be performed, the required completion time, contract sum, provisions for progress payments and final payment, and lists the other documents making up the complete contract.
b. Conditions of the contract (usually general conditions and special conditions); the general conditions contain those contract provisions applicable to most construction contracts written by the owner. The special conditions contain any additional contract provisions applicable to the specific project.
c. Plans and specifications; Construction plans together with specifications provide a complete description of the facility to be constructed.
d. Contract documents refer to the drawings, specifications as well as all other necessary supporting documents (Gould, 1997). According to Section 2.32 of the Nigerian National Building Code (2006), contract documents shall mean:
e. Contract drawings and specifications prepared by registered Architects and registered Engineers;
f. Priced bill of quantities prepared by registered Quantity Surveyor;
g. Construction programme, Project Quality Management Plan, Project Health and Safety Plan prepared by a registered Builder;
h. Conditions of contract; and
i. All risk insurance for the building works personnel and equipment.

It is important for construction professionals to fully appreciate the contract documents and how they are applied to the construction process.

Builders Documents

As against the backdrop, The Nigerian National Building Code (2006) makes it clear that the Construction Programme, Project Quality Management Plan, Project Health and Safety Plan shall be prepared by a registered Builder. This forms the basis that these documents are the Builders documents.

Construction Programme

Construction Programme is a professionally thought out synthesis of the construction of a building project on site with the objective to minimize cost and optimize use of resources (Bamisile, 2004). It gives a suitable level of production flow. The Builder studies each operation critically with a view to finding the optimum method of production. It must be unique and be specific to a particular project. It must not be copied from one project to another. The Construction Programme for any building is based on the operational methods and sequence of operations described in the Construction Methodology.

Some components to be captured in the construction programme are:

a. Key operations: according to The Builders Document Template (2010), a building comprises of the following key operations presented in Table 1.
b. Construction limitations: items covered under this include Working hours, Site access, Site security, Noise, Parking, Building perimeter, Weather, and Material handling and distribution.
c. Statutory Notices: items covered under this include:

i. Notice to commence work;

ii. Notice to start excavation on satisfactory completion of setting out;

iii. Provision of evidence of *professional input relevant construction* programme;

iv. Obtaining stage satisfactory completion certificates;

v. Notice of practical completion; and

vi. Obtaining for the employer "Certificate of Completion and Fitness for Habitation.

d. Construction site layout: items covered under this include Access point, Hoarding and fence, Location of site accommodation, Water for the works, Power, Telephones, and Disposal of solid waste/debris.
e. Temporary works: items covered under this include criteria for the design of false-work, Earthwork support and Scaffolding.
f. Tools, plant and equipment
g. Production methods: under this are cast in-situ production and precast production.

Table 1: Key Operations of a Building

S/No	Operation
1	Setting out
2	Excavation of foundation trenches/pad bases including concrete blinding
3	Preparation and application of dieldrex anti-termite solution
4	Reinforced concrete pad foundation and concrete footing in trenches
5	Casting of concrete columns in substructure
6	Block -work to damp proof course (DPC) including filling cavities with concrete
7	Laterite earth filling
8	Hardcore including blinding with sand
9	Casting of plain concrete ground floor slab
10	Reinforced concrete columns, beams and suspended slab
11	Blockwork and erection of lintels
12	Reinforced suspended concrete slabs
13	Roof structure
14	Taking physical measurement of erected roof structure in order to obtain accurate sizes of roof covering
15	Plumbing pipe-work and sanitary wares
16	Electrical conduit and electrical fittings
17	Installation of generators
18	Cement/sand rendering
19	Cement/sand screeding
20	Glass block
21	Suspended ceiling
22	Wall/floor Tiling
23	Windows and curtain wall finishing
24	Hardwood panel doors including Mortice union locks and handles
25	Painting
26	Septic tank and Soak-away pit
27	Manholes
28	Furnishing
29	Cleaning of the buildings prior to handing over.

Source: Builders Document Template (2010)

Quality Management Plan

The Quality Management Plan (QMP) is a document that checks the quality of the construction project in a proactive manner. Quality as defined by Crosby (1979) is conformance to requirements. Juran (1989) defines it as fitness for use. Park (2000) asserts that quality is meeting the customer's needs and expectations at a price he/she is prepared to pay.

According to Turbit (2005), in technical terms, quality can be considered as a set of metrics/brochures established to answer the following:

Does the system comply with corporate standards for such things as user interface, · documentation, naming standards etc.;

Is the technology stable; and

Is the system well engineered so that it is robust and maintainable?

Quality Management (QM) has become an increasingly common practice in both the public and private service sector. It has grown from some simple control techniques into a system of improvement that involves an entire organization. International Standards Organisation (ISO 8402), define QM as "all activities of the overall management function that determine the quality policy, objectives and responsibilities, and implement them by means such as quality planning, quality control, quality assurance and quality improvement, within the quality system". Quality management is performed throughout a project life cycle with special attention to quality assurance, quality control, etc.

Quality planning is very important during the project planning process. It is a degree to which the project fulfills requirement. According to Turbit (2005), quality planning needs to identify the following elements:
What need to go through a quality check;
When should it be carried out;
Who should be involved; and
What quality materials should be used?

Quality Management Plan (QMP) determines quality policies and procedure relevant to the project for both project deliverables and project processes, defines who is responsible for what, and documents compliance. Also the QMP describes and defines participants' roles, quality review responsibilities and activities; quality requirements for design/construction integration; the specific quality measures and application instructions; and necessary quality assurance (QA) documentation and verifications to which technical reports, project documents, design drawings, engineering calculations and construction documentation must comply. QMP identifies the design quality requirements, including:
Certification that the design satisfies the requirements of the Contract; and
Accuracy, adequacy, conformance to standards of practice, compliance with codes and standards, cost effectiveness, quality, and fitness for purpose and function as specified in the Contract.

The QMP requires four phase control of construction quality, consisting of:
Preparatory Phase before construction;
Initial Phase at the outset of each new operation; Follow-up Phase of inspection and testing to determine continuation of compliance and workmanship as established in the preparatory and initial phases;

Final Acceptance of Work Phase
According to the Council of Registered Builders of Nigeria (CORBON), the quality plan should include the following:

a. *A quality policy statement: (vision* and mission); this outlines the intentions and aims of the company with respect to achieving quality work. Usually, this statement will refer to meeting or exceeding requirements of the client and will be a broad statement of intent.
b. Project Quality Structure & Quality Management System; these sets out how quality achievement is incorporated into the project and who is responsible for achieving quality at project level. The system for dealing with quality documentation should be set up at the planning stage and should be clearly delineated in the plan so that each person on the project knows where the information is and how to access it.

c. Quality objectives for the project; these objectives will be read alongside the contract documents and scope of work information. The plan will refer to the drawings and specifications and will outline the specific objectives that need to be met in respect of different quality aspects of the project
d. Rectification of Problems and Prevention of future problems; This part of the plan will set out the ways in which any problems will be rectified, including a system for dealing with wastage should it arise, and collective action to be taken in order to deal with any problems.

An effective QMP result in reduction of inefficiencies and wastes, improved work practices, increased morale and the opportunity for a greater market share. All these benefits are achieved through the implementation of QMP which project stakeholders should perceive as a wide-scale failure prevention programme that will lead to costs savings.

Health and Safety Plan

Health as defined by the World Health Organization (WHO) in 1948 is a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity. World Health Organization also asserted that health is a resource for everyday life, not just the objective of living. Health is a positive concept emphasizing social and personal resources, as well as physical capacities. The word safety according to Webster's New World Dictionary is defined as the quality or condition of being safe; freedom from danger, injury, or damage; security.

Broadly, Occupational Safety and Health (OSH) are fundamentally concerned with the interrelationship of people at work, the work they undertake, and the working environment, including work organization. OSH encompasses the effects of the working environment on the health and well-being of the worker as well as the influence of a worker's state of health (physical and mental) on their ability to perform the tasks for which they are employed.

Occupational health should aim at the promotion and maintenance of the highest degree of physical, mental and social well-being of workers in all occupations; the prevention amongst workers of departures from health caused by their working conditions; the protection of workers in their employment from risks resulting from factors adverse to health; the placing and maintenance of the worker in an occupational environment adapted to his physiological and psychological capabilities; and, to summarize, the adaptation of work to man and of each man to his job.

The main focus in occupational health is on three different objectives:

a. The maintenance and promotion of workers' health and working capacity;
b. The improvement of working environment and work to become conducive to safety and health; and
c. Development of work organizations and working cultures in a direction which supports health and safety at work and in doing so also promotes a positive social climate and smooth operation and may enhance productivity of the undertakings.

The Construction (Design and Management) Regulations 2007 (CDM 2007) is aimed at integrating health and safety into the management of the project and to encourage everyone involved to work together to:

a. Improve the planning and management of projects from the very start;
b. Identify risks early on;
c. Target effort where it can do the most good in terms of health and safety; and
d. Discourage unnecessary bureaucracy.

These Regulations are intended to focus attention on planning and management throughout construction projects, from design concept onwards. The aim is for health and safety considerations to be treated as an essential, but normal part of a project's development not as an afterthought.

Construction Hazards

The term construction hazard is defined as anything that can cause harm such as scaffold, excavation, roof work, working from ladders and etc. According to AbdulHamid *et al.*, (2003), there are two major categories of hazards in construction sites namely:

a. The risk of physical injury or physical injury hazard; and
b. The risk of ill health or health hazard.

The physical hazards are normally associated with work processes or equipment used and climatic conditions such as scaffolds, manual handling, ladder, roof work, plant and machinery, excavation, etc. Health hazards in construction work may be grouped under chemical, physical and biological hazards.

AbdulHamid *et al.*, (2003) further stressed that hazard that has risk of physical injury can cause direct injury to workers on site and if severe can cause death. However, hazard that has risk of ill health can only be noticed after a long period of time. In order to ensure a safe and conducive working condition there are three basic steps that should be taken namely:

a. Identifying the hazard;
b. Assessing the risk; and
c. Controlling the risk.

Ringen and Stafford (1996) pointed out that construction is one of the largest industries in the United States, with 13% of the gross national product and 5–6% of the labour force. It is also one of the most dangerous industries, accounting for 15% of occupational fatalities and 17% of all workers' compensation costs.

Health and Safety Management Systems

According to Griffith and Howarth (2000) the key driver to achieving a safe and healthy working environment is to ensure that health and safety issues are assessed, planned, organized, controlled, monitored, recorded, audited and reviewed in a systematic way. An appropriate way for the principal contractor to address the legislative requirements, corporate business needs and practical project demands of health and safety is to establish a health and safety management system within the organization. Such an approach can be a dedicated system or one which forms part of an existing organizational management system, such as a quality system. Through the establishment of a formal management approach to health and safety, the principal contracting organization will be able and well equipped to develop a strong and positive health and safety culture. It will be able to develop the policies, plans, management procedures and safe working practices essential to achieving successful construction health and safety management.

Responsibilities for Health and Safety on Site

Griffith and Howarth (2000) affirmed that health and safety is a paramount consideration for all construction workers. It impinges upon the work of the planning authorities, clients, consultants, contractors and all others who work or are in the vicinity of a construction project. Goetsch (2003) assert that although one or more people can be given the primary responsibility for coordinating, facilitating, and directing a company's safety and health activities, all construction personnel share the responsibility for safety. He continued by saying that at construction sites, safety must be a team sport. The team consists of players such as contractors, managers and other professional personnel, supervisors, and employees or subcontractors. To this group, some companies add one or more safety and health professionals.

The contractors, as the owners of the company, bear the ultimate responsibility for safety and health on their job sites. The contractors according to Goetsch (2003) are responsible for:

a. Setting a pro-safety tone for the company;
b. Establishing a complete commitment to safety and health from top down; and
c. Ensuring that sufficient resources are provided to support a comprehensive, company-wide safety effort.

Managers and other professionals are responsible for setting a positive example relating to safety and health and for translating the commitment of the contractor into everyday practice. This according to Goetsch (2003) can be achieved by the following types of actions:

i. Developing job descriptions that make safety and health part of every employee's job;
ii. Developing performance appraisal forms that contain safety and health criteria;
iii. Rewarding safe behaviour on the job by making it an important factor in promotions;
iv. Developing work procedures that emphasize safety and health;
v. Recognizing safe work behaviour as a part of company incentive programs;
vi. Ensuring that the company has a comprehensive and effective safety and health program;
vii. Keeping up to date with the latest safety and health standards and regulations; and
viii. Effectively communicating safety and health information to all employees and subcontractors.

CORBON (Project Health and Safety Plan) states that every worker is under moral, and often also, a legal duty to take the maximum care for his or her own safety and that of fellow workers. Poor health and safety management costs the construction industry millions of pounds annually (Griffith and Howarth, 2000). Across the UK economy the cost to business and commerce runs into billions of pounds each year. They went on to say that more fundamental and of greater importance is that poor health and safety management cost lives.

Construction continues to be one of the most hazardous industries in which to work. Injuries, accidents and dangerous situations are common place. Ringen et al (1995) assert that workers in the building, renovation, and demolition of roads and commercial structures in the U.S. suffer a disproportionate share of occupational fatalities and lost-time injuries. They went on to say that nearly all the injuries and deaths are preventable. The safety and health problems in their opinion are largely tied to the construction industry's organization and how work is performed. Potential solutions are in labour-management site safety and health planning and management, education and training of workers and supervisors, new technologies, occupational health delivery, etc. (Ringen *et al.*, 1995).

According to the Council of Registered Builders of Nigeria (CORBON), the improvement of safety, health and working conditions depends ultimately upon people working together, whether governments, employers or workers. Safety management involves the function of planning, identifying problem areas, coordinating, controlling and directing the safety activities at the work site, all aimed at prevention of accidents and ill health.

CORBON (Project Health and Safety Plan) states that safe and healthy working conditions do not just happen by chance. Employers need to have a written safety policy for their enterprise setting out the safety and health standards which it is their objective to achieve. In Griffith and Howarth (2000), the construction industry has a perpetual and unswerving challenge to deliver and maintain a safe working environment. Effective health and safety management demands a clear vision, a systematic approach and a sustained commitment to improvement.

Husin *et al.*, (2008) noted that an overview of construction quality and safety reveals many striking similarities for these two management concept. Programs that have been developed to improve quality and safety performance have many elements in common. In some cases safety is considered a part of Total Quality Management (TQM).

Bamisile (2004) listed the preparation of production management documents which include project health and safety management plan among others as one of the roles of a builder in construction of buildings. The preparation and use of Health and Safety Plan on building projects cannot be over emphasized. It is a major part of production management of building projects.

All the foregoing factors has emphasized that the inclusion of project health and safety management plan as one of building production management documents is indispensable. The Nigerian National Building Code (2006) in section 2.32 has saddled the builder with the responsibility of production of this along with the other documents.

Methodology

Data Source

For primary data, a structured questionnaire was used to fetch data for this research. Secondary data sources for this study are: journals, published/unpublished articles, conference scripts, textbooks, and the Internet.

Sampling Method and Sample Size
Simple random sampling was used for this study. One hundred and thirty one students (respondents) enrolled in the part-time Post Graduate program of the Department of Building, Ahmadu Bello University Zaria, Nigeria; served as the study population for this research. Relating this to assertions by Morgan (2007), 75 percent (98 students) will constitute the sample size of this research.

Presentation and Discussion of Results
Of the 98 questionnaires distributed, a total of 76 (77.55 percent) were successfully retrieved in the field survey conducted as a part of the study. Since the overall return rate for the questionnaires in the work of Morris and Dennison (2005) was about 75 percent, as such the return rate of this research is justifiable.

Profession of Respondents
The respondents belong to five professions as follows: Architecture, Building, Quantity Surveying, Engineering and Estate Surveying. Figure 1 shows the total number of respondents by their respective professions. A breakdown shows that there are six Architects, thirty three Builders, twenty four Quantity Surveyors, nine Engineers and four Estate Surveyors.

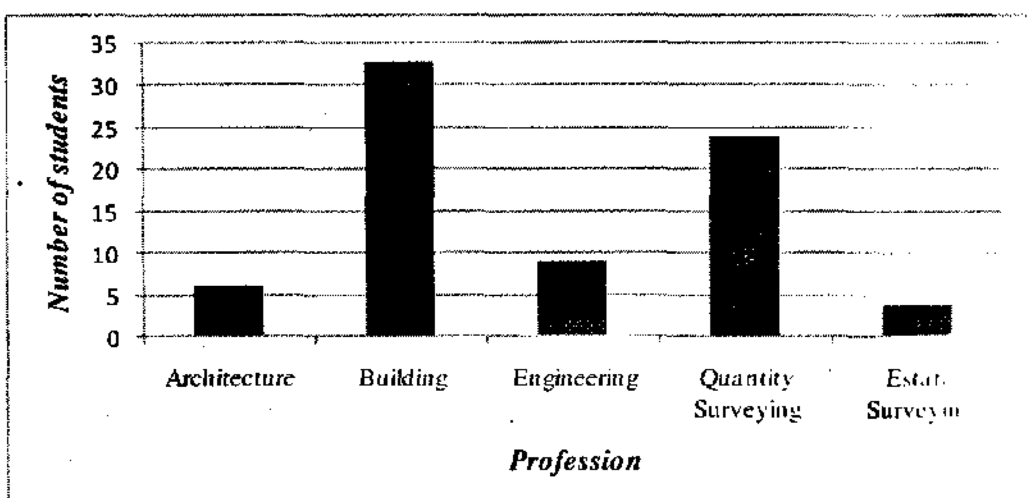

Figure 1: Number of Respondents by Profession

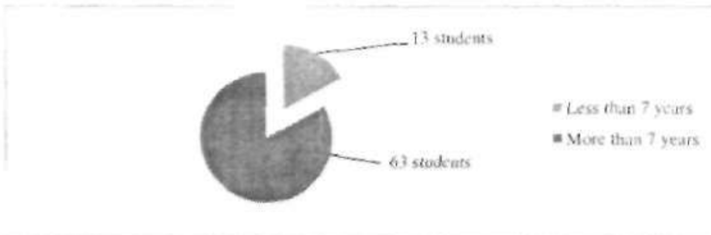

Figure 2: Years of Working Experience of Respondents

Working Experience of Respondents

Thirteen students have between 1 to 7 years' working experience while sixty three students have over 7 years of working experience.

Awareness on Builders Documents

More than eighty eight percent of the respondents (67 nos.) attested to the fact that they are aware of the set of documents called the Builders documents while the remaining 12 percent (9 nos.) attested that they are not aware of the documents. Results are shown in Figure 3

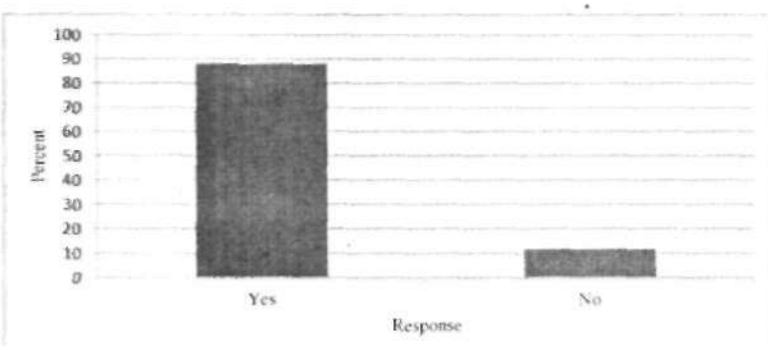

Figure 3: Awareness of Builders Documents

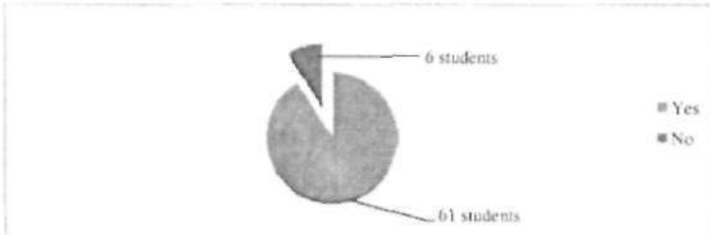

Figure 4: Usage of documents in project execution

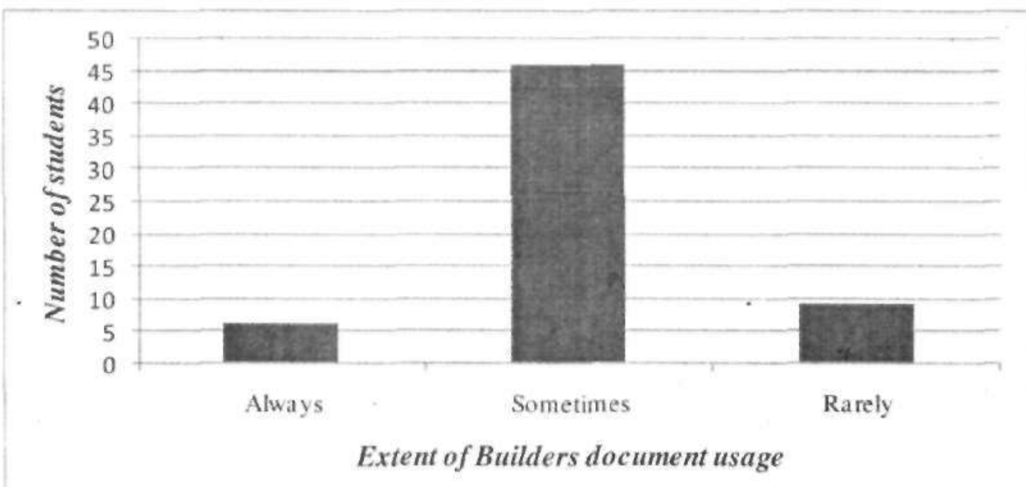

Figure 5: Extent of Builders Documents Usage

Usage of the Documents
From Figure 4, sixty one respondents admit to using the Builders documents in execution of projects while six of them admit that they do not use them.

Extent of Builders Documents Usage
Figure 5 shows the extent of usage of the Builders documents among the 61 respondents that admitted to using them.

Six respondents 'always' use the Builder's documents in project execution, forty six respondents 'sometimes' use the documents and nine respondents 'rarely' use the documents in construction projects execution.

Number of Builders Documents Used

Of the four Builders documents studied 34 respondents attested to using one document, 17 respondents use two of the documents, 5 respondents use three of the documents and 5 respondents use all four documents in project execution. Such is shown in Figure 6.

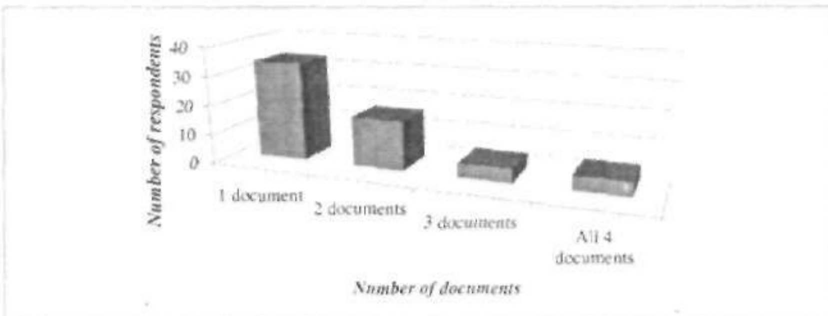

Figure 6: Number of Builders Documents Used

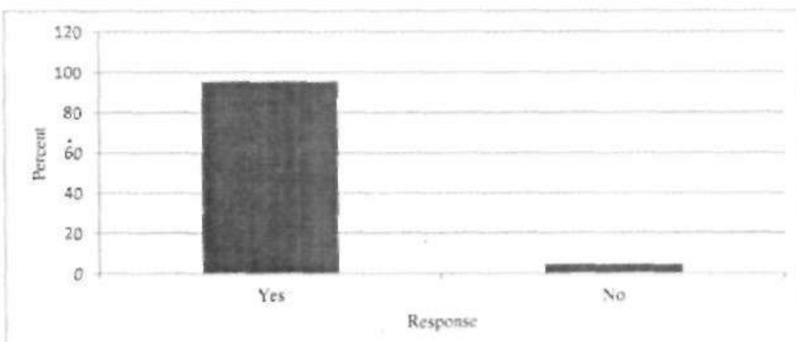

Figure 7: Level of Support of Inclusion of Builders Documents as Contract Documents

Level of Support of Inclusion of Builders Documents as Contract Documents

As depicted in Figure 7. Over 95 percent (64) of the respondents support the inclusion of the Builders documents as part of contract documents while about 5 percent (3) do not support such.

Summary of Findings and Conclusion

From the results against the backdrop, the following findings may be deduced:

a. Even though the Builders documents gained limelight in its inclusion in the National Building Code since 2006, some professionals are still not aware of its existence;
b. Of the respondents aware of the existence of the Builders documents, some still do not use any of them.
c. Not up to 10 percent of the respondents that use the Builders documents use them in every project;
d. Majority of the respondents are in support of inclusion of the Builders documents as contract documents.

It may be concluded that the Builders documents are underutilized in Building projects delivery in the Nigerian Construction Industry even though the majority of the professionals welcome it as a contract document. As such, it is recommended that while more enlightenment should be done on the importance of the Builders documents in Building project delivery, better implementation mechanisms of the documents should be enforced by statutory authorities so that construction delivery will be more efficient.

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