

An Assessment Of Foundation Design Of Buildings In Lagos

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Abstract- A building, once properly constructed is expected to be in use for a very long time. Although every society has its own problems and Nigeria is not an exception yet the very recent challenges of buildings collapsing in various locations have been giving the various arms of government and the people of Nigeria sleepless nights in view of the enormous loss of huge investments in housing, properties and human life. News reports of such incidences are frequently reported in the country by both the print and electronic media. In 2006 alone, no fewer than thirteen of such cases were recorded in Lagos State alone while statistics of the previous and subsequent years were not better off either. This study was set out to empirically ascertain the causes of such building failure and collapse from the perspective of the stakeholders (comprising of the professionals in the building industry, contractors and house owners/developers) with a view to proffering appropriate recommendations to guide against occurrence, Lagos State was chosen as the case study based on the frequency of occurrence of building collapse in the State. To achieve the objective of the study, questionnaires were randomly administered on the professional; Estate Surveyors and valuers. Architects, Town Planners, Quality Surveyors, Engineers (structural and civil), building contractors and Landlords/developers in the study area to seek their opinion on their perceived causes of building collapse. The study identified the use of sub-standard building materials, poor workmanship by contractors, use of incompetent contractors, faulty construction methodology, heavy down pour, non-compliance with specifications/standards by developers/contractors, inadequate/lack of supervision/inspection/monitoring, structural defects, defective design/structure, illegal conversion/alterations/additions to existing structures and dilapidating structures as the

major causes of building collapse in Lagos State and Nigeria at large. This study reviews current challenges in the building industry in relation to collapse of buildings, loss of lives and properties. The study recommends that the government should, on one hand, embark on proactive steps by mustering enough political will to allow the Town Planning Authorities to perform their functions unfettered and on the other hand, provide the legal framework that can improve and ensure smoother, less time-consuming and less burdensome ways to conduct business in the functioning of law courts.

Keywords—Foundation, Lagos, Building Collapse, Lagos etc

1. INTRODUCTION

The role of buildings to human's existence and survival is indisputable. Apart from giving protection from elements of nature and providing storehouse for personal possessions building offer such infrastructure and services that would make dwellings conducive. Right from the Stone Age when man dwelt in caves to the present age of sophisticated buildings and superstructures, man has always been caught up in the struggle to provide for himself a safe and comfortable dwelling place. Despite this fact, collapse of buildings has been a universal problem that has eaten deeply into the fabrics of the construction industry, of which very little has been done to curb the menace (Olagunju, 2013).

Failure in building could also be of two types, namely, cosmetics and structural failure. The former occurs when something has been added to or subtracted from the building, thus affecting the structural outlook. The later affects both the outlook and structural stability of the building (Ayinoluola and Olalusi, 2004). In line with the above assertions, building collapse can simply be defined as a total or partial/progressive failure of one or more components of a building leading to the inability of the building to

perform its principal function of comfort, satisfaction, safety and stability.

1.2 Aim

This research is aimed at investigating causes and possible solutions to common building failures in Lagos State Nigeria.

1.3 Research Objectives

The objectives of the research are as follows:

1. To determine the relationship between poor construction supervision and unsustainable building construction practices (use of substandard designs, materials, manpower & procedures) in Lagos state.
2. To evaluate the extent of the relationship between poor construction supervision and increased rate of building failures in Lagos state.
3. To determine the roles foundation (substructures) place in building failures in Lagos state.
4. To determine the adverse effects of foundation failures in Lagos state.

1.4 Study Area

In this project, three areas in the mainland (Ikeja, Agege and Ebute Meta) and three areas in the island (Ajah, Lekki and Ikoyi), are used as case studies.

1.5 Scope and Limitation

This project research is limited to residential buildings, institutional buildings and ongoing construction work.

Questionnaire would only be administered to the following set of people Estate Surveyors and Valuers, Architects, Town Planners, Quantity Surveyors and Engineers (Civil and Structural Engineers), building contractors and some Landlords/developers as regard why building collapses.

Table 1.1 Questionnaire Distribution to the Respondent Stakeholders and Response Rates

Stakeholders	Questionnaire Distribution	Response Rate	Percentage (%)
Architects	12	9	75
Building Contractors	35	20	57
Engineers (Civil/Structural)	12	12	100
Estate Surveyors/Valuers	12	8	67
Quantity Surveyor	12	11	92
Landlords/Developers	150	90	60
Town Planners	12	7	58
Total	245	157	64.08

2. Residential Buildings within the Island: Ajah, Lekki, Ikoyi

Data shows that for residential area within the Island (Lekki, Ajah and Ikoyi) and other water logged areas such as part of Ebute-Meta, the swamp has to be first filled with sand and laterite then compacted mechanically before raft foundation is built. Result shows that 75 % of residential areas within Ajah and Lekki have raft foundation unlike Ebute-meta where about 21 % of Residential buildings rest on pile or pad foundation while 43 % has raft foundation, 25 % has combined pad and strip foundation and 11 % has strip foundation.

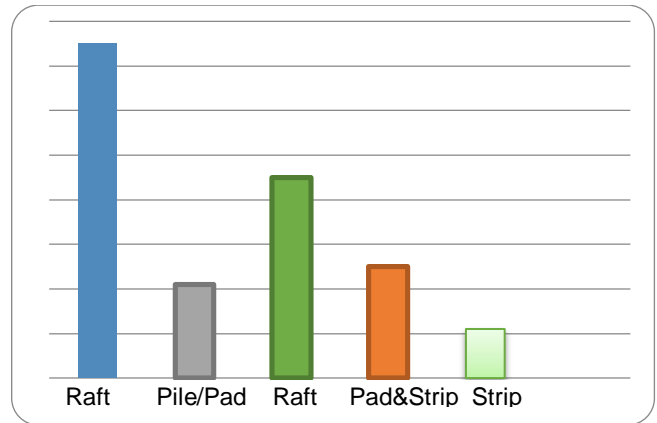


Fig.1.1

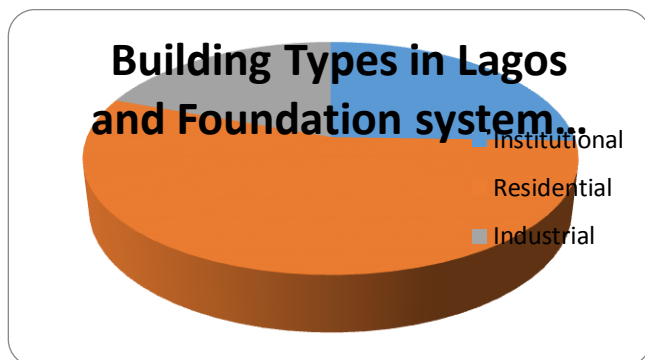
Reasons Adduced for Incessant Building Failure and Collapse from the Building Professionals Perspective

Perceived causes	SA	A	N	D	SD	TOTAL
Dilapidating Structures	14	12	6	6	9	47
Defective Design/Structure	10	10	8	6	13	47
Heavy downpour	10	15	8	7	7	47
Sub-Standard building materials	18	12	5	7	5	47
Poor workmanship by contractors	19	16	3	4	5	47
Use of incompetent contractors	15	12	7	5	8	47
Faulty construction methodology	10	13	6	7	11	47
Noncompliance with specifications/standards by developers/contractors	14	13	6	5	9	47
Inadequate/lack of supervision/inspection/monitoring	16	12	6	5	8	47
Structural defects	13	12	8	3	6	47
Illegal conversion/alteration/additions to existing structures	16	13	5	5	8	47

Table 4.4 Reasons Adduced for Incessant Building Failure and Collapse From the Landlords/Developers Perspective

Perceived causes	SA	A	N	D	SD	TOTAL
Dilapidating Structures	15	17	15	23	19	90
Defective Design/Structure	23	19	11	23	14	90
Heavy downpour	16	23	12	26	13	90
Sub-Standard building materials	19	15	16	23	17	90
Poor workmanship by contractors	22	18	17	19	14	90
Use of incompetent contractors	18	25	15	20	12	90
Faulty construction methodology	17	14	26	26	7	90
Noncompliance with specifications/standards by developers/contractors	11	18	23	23	15	90
Inadequate/lack of supervision/inspection/monitoring	18	16	24	19	13	90
Structural defects	21	15	24	15	15	90
Illegal conversion/alteration/additions to existing structures	19	15	10	23	23	90

In conclusion, it is observed that about 54 % of buildings in Lagos are residential and strip foundation is the main type of foundation system especially within the main land areas while 27 % of buildings are institutional and pile foundation is the main type of foundation used for institutional building in Lagos whereas industrial buildings are represented by 19 % and pad foundation is the major foundation system



3. Conclusion

From the study the following conclusions are made:

This study has been able to identify several causes of building failure in Lagos State. It has highlighted several case studies of building failure in Lagos State including casualties of those incidents. The losses always experienced as a result of building failure are enormous; ranging from loss of lives, several forms and degrees of injuries, loss of properties, etc. The National Building Code is a very important document which will greatly reduce the occurrence of building failures in Lagos state and Nigeria at large.

However, with the introduction of building code now in place, the building experts otherwise called professionals will be put on their toes in rendering qualitative work as well as impeding clients from the use of quacks in property development. Various regulatory bodies such as Nigerian Institute of Architects, Architects Registration Council of Nigeria, Nigerian Society of Engineers, Council of Registered Engineers in Nigeria, Nigerian Institute of Builders, Nigeria Institute of Quantity Surveying and others in the building sector to beam their search light in making sure that defaulting builders are not only apprehended but also prosecuted.

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