

## ASSESSMENT OF NATIONAL PROJECT HEALTH AND SAFETY PLAN TEMPLATE COMPLIANCE BY BUILDING CONSTRUCTION INDUSTRIES IN ABUJA METROPOLIS

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### Abstract

The study assessed the level of compliance with Health and Safety Plan on Scaffolding and Roof works in Building construction site in Abuja Metropolis. Two research questions were raised and answered as well as two hypotheses were formulated and tested at 0.05 level of significance. Descriptive survey research design was adopted for the study. Study was conducted at building construction site in Abuja Metropolis. The population of this study comprised of 127 respondents from the selected registered construction companies in Abuja Metropolis. A structured questionnaires which contain 50 items was designed to obtain information from the respondents. The instrument was subjected to face and content validation by three experts, which include two in Building Technology Education, Federal University of Technology Minna, one from Niger State Ministry of Work and Infrastructural Development (MOWID). The reliability coefficient of the instrument was determined using Cronbach Alpha formula and reliability index of 0.81 was obtained. The data collected was analyzed using mean and standard deviation while t-test statistics was used to test the null hypotheses at 0.05 level of significance. Base on the data analyzed the following findings among other revealed that erection of scaffold under the supervision of competent personnel are not complied with, erection of guard-rail and toe to a safer height at the opening site are not effectively complied with, precaution are not taken to effectively stop debris falling on to others working under the roof. Base on the finding it was recommended that, Government should provide appropriate inspection services and enforce the application of the Health and Safety Plan officers in order to ensure compliance by all building construction industries in Abuja Metropolis. Construction Company should appoint qualified personnel whose special and main responsibility is the promotion of health and safety at all Building construction site.

**Keywords:** Compliance, Accident, Health, Safety, Scaffolding, Roof Work.

### Introduction

Building construction industry is unique among all other sectors because it provides the necessary infrastructures that stimulate national development (Olanrewaju & Abdul-Aziz, 2015). Building construction industry in Nigeria, remain one of the key economic sectors in terms of its Gross Domestic Product (GDP) and employment. The quest for the provision of adequate housing has led to an increase in the activities of the building construction industry in Abuja Metropolis. Little or no attention is paid to the safety of the workers who see to the realization of these buildings, they are mostly illiterate and are ignorant of their rights and privileges. As such, building construction workers are constantly being made to work under unsafe conditions which pose danger to their lives. A certain proportion of Nigerian population are employed in the building construction sites and a great majority of them are exposed to varying levels of risks to their health and lives. Some of these risks associated with building project health and safety as identified by Muiruri and Mulinge (2014) include non-provision of health and safety environment, non-implementation of health and safety risk response strategies and noncompliance with health and safety plan.

Level of compliance with building project health and safety practices in Nigeria and Abuja metropolis in particular, is of great concern to professional builders and site workers. Compliance can be described as an act or process of following or obeying a rule or order in doing an assign task. Despite the existence of regulatory system and standard in many building construction industries in most countries the accident occurrences persists. The accidents and fatalities rate in building construction industries is attributed to the noncompliance by contractors with safety and health regulation on building construction sites (Baxendale & Jones, 2010). Looking at the side effect of construction related injuries on workers and the project success in Abuja metropolis, building health and safety plan must be given high priority by the construction participants to ensure human safety against occurrence of accidents in working with scaffolding.



Scaffolding is a temporary structure and temporary working platform used to support people and material in the construction or repair of buildings and other large structures. According to Occupational Safety and Health Association (OSHA) (2016) there are many different types of scaffolding and the precise names and terminology tend to vary based on the type of weight it can support. These are, independent tower, bracket tower, and scaffold tower supported by building, suspended scaffold and trestle scaffold. The main use of construction scaffolding is to support construction work at elevated and inaccessible locations. Scaffolding accidents have many causes, the main factors causing the scaffolds accidents are inappropriate work practices; inappropriate construction of scaffolding including planking; safety equipment not used and unexpected force shifted scaffolding while working at roof top (Mogarkar & Varghese, 2012).

Roof as one of the important component of a building, provides the principal line of defense against all elements while its design significantly affects its overall appearance. The building project is not complete without a decent roof. Basically, roofs can be classified into three major categories: flat, sloppy and arc or curve roofs. According to Hawkins (2012) the roof is the most vital component of a building to maintain but the most disregarded. Against this backdrop, roof cannot under any circumstance be ignored in any construction work or research work due to its significant importance. Mattison, (2011) supported this notion by stating that about fifteen (15) percent of all newly constructed roofs fail during the first six years of usage. These statistics is a proof that most industries are using inferior materials, careless installation and overlooked maintenance. It is against these backdrop that the researcher aimed at determining the level of compliance with Health and Safety Plan on Scaffolding and Roof works in Building construction site in Abuja Metropolis.

### Statement of the Research Problem

Despite the existence of regulatory system and standard in many building construction industries in most countries the accident occurrences persists. Olanrewaju and Abdul-aziz (2015) observed the rise in building construction sites accident and related has also increased with little or no documentation. Some of these accidents occur due to illiteracy, lack of commitment to work and noncompliance with health and safety plan among others. However, noncompliance with health and safety plan and lack of stringent implementation of functional safety in building construction site is bound to lead to an increase in the number of accidents and fatalities (Agwu and Olele, 2014). Building construction operations are risk prone activities from the excavation, blocklaying, operation above the ground level with the aid of scaffolding, roof operation work and many others.

Hence, there is need to find a way of minimizing the rate of construction related accidents in Abuja metropolis, through compliance with health and safety plan. It is against this backdrop that this research will be carried out to determining the level of compliance with Health and Safety Plan on Scaffolding and Roof works in Building construction site in Abuja Metropolis.

### Purpose of the Study

1. The level of compliance with health and safety plan on scaffolding in building construction site in Abuja Metropolis.
2. The level of compliance with health and safety plan on roof workin building construction site in Abuja Metropolis.

### Research Questions

1. What is the level of compliance with health and safety plan on scaffoldingby building construction site in Abuja Metropolis?
2. What is the level of compliance with health and safety plan on roof work by construction site in Abuja Metropolis?

### Research Hypotheses

**Ho<sub>1</sub>:** There is no significant difference between the mean responses of professional and site workers on the level of compliance with health and safety plan on scaffolding at construction site in Abuja Metropolis.

**Ho<sub>2</sub>:** There is no significant difference between the mean responses of professional and site workers on the level of compliance with health and safety plan on roof work at construction site in Abuja Metropolis



### Methodology

The study adopted descriptive survey research design, this is because it involves the use of structured questionnaire developed from the review of related literature to determine the opinion and perception of respondents. The study was conducted in Abuja Metropolis. The population of this study comprised of 127 respondents consisting of 52 professional and 75 site worker from the selected registered construction companies in Abuja Metropolis. A structured questionnaires which contain 50 items was designed to obtain information from the respondents. The instrument was subjected to face and content validation by three experts, which include two in Building Technology Education, Federal University of Technology Minna, one from Niger State Ministry of Work and Infrastructural Development (MOWID). The reliability coefficient of the instrument was determined using Cronbach Alpha formula and reliability index of 0.81 was obtained. The data collected was analyzed using mean and standard deviation while t-test statistics was used to test the null hypotheses at 0.05 level of significance.

The questionnaire was administered to the respondent by the researcher, the method used in collecting the answered questionnaire was immediate or otherwise where necessary. Mean and standard deviation was used to answer the research questions, while t-test statistics was used to test the hypotheses at 0.05 level of significance. The decision for each questions was based on result means score interpreted related to the concept of the real lower and upper limit number 1-4. The null hypothesis was tested using t-test Statistics at 0.05 level of significance.

### Results

#### Research Question 1

1. What is the level of compliance with health and safety plan on scaffolding by building construction site in Abuja Metropolis?

**Table 1 Mean and Standard Deviation of the Responses of the Respondents on the Level of Compliance with Health and Safety Plan on Scaffolding by Building construction site in Abuja Metropolis.**

N <sub>1</sub> =52, N <sub>2</sub> = 75.		N <sub>T</sub> =127		
S/N	ITEMS	$\bar{X}$	SD	Remark
1.	Roof works are inspected by competent person at least once in a week.	3.56	0.85	Highly complied
2.	Proper access to all part of the scaffold platform.	3.62	0.54	Highly complied
3.	The upright of the scaffolds are mounted on proper base plates in order to prevent slipping or sinking.	3.61	0.49	Highly complied
4.	Used of seasoned or proper grade planks for working platform.	3.17	0.66	Complied
5.	Proper securing of platform to prevent collapse.	3.02	0.67	Complied
6.	Erection of guard -rails and toe to a safer height at the opening site.	3.56	0.69	Highly complied
7.	Evenly distribution of material on scaffold to avoid over loaded.	3.36	0.51	Complied
8.	Proper locked and secure of wheels mobile tower.	3.62	0.54	Highly complied
9.	Access ladders for tower scaffolds are fitted internally and not externally.	3.17	0.66	Complied
10.	Workers on suspended scaffolds are using lifeline anchored overhead to the building and not to the scaffold.	3.02	0.67	Complied
11.	Scaffold is inspected by competent person at least once in a week.	3.50	0.68	Highly Complied
12.	Inspections of scaffold are recorded and signed by the person in charge.	2.38	0.69	Moderately complied

Key:  $N_1$ =Number of professional and workers in the building construction industries in Abuja Metropolis,  $X$ = Mean responses of the professional and workers in the building construction industries in Abuja metropolis.

The analysis of the result in Table 1 shows that respondents highly complied with six (6) items in the questionnaire as regards the level of compliance with health and safety plan on scaffolding by construction site in Abuja Metropolis, with the mean ranges from 3.50 to 3.62 and the standard deviations ranges from 0.49 to 0.90, this signifies that the respondents were closer to each other in their responses.

### Research Questions 2

What is the level of compliance with health and safety plan on roof work by construction site in Abuja Metropolis?

**Table 2 Mean and Standard Deviation responses of the respondents professional and workers as regards to the level of compliance with health and safety plan on Roof work by building construction site in Abuja metropolis**

$N_1=52, N_2= 75, N_1=127$

S/N	ITEMS	Mean	S/Deviation	Remark
1.	Proper crawling ladders are used to work on roof slopes of more than 10 degree.	3.01	0.62	Complied
2.	Use of sufficient guard -rails and toe boards for roof work.	3.57	0.63	Highly complied
3.	There is crawling board for work above fragile material such as glass or asbestos.	3.37	0.59	Complied
4.	Warning notices are at all approaches to fragile roof.	3.61	0.49	Highly complied
5.	Roof workers are provided with personal protective wears such as helmet.	3.02	0.67	Complied
6.	Guard-rails are used when it's necessary to work close to fragile material or roof light.	2.96	0.75	Complied
7.	Proper working tools and equipment's provided for workers.	3.06	0.73	Complied
8.	Precautions are taken to stop debris falling on to others working under the roof.	3.01	0.62	Complied
9.	Use of mechanical to supply heavy equipment/materials.	3.57	0.63	Highly complied
10.	Regular use of nose mask to prevent breathing in of asbestos's fibre	3.36	0.51	Complied
11.	Well-equipped first aid box are provided where more than 25 workers are expected to work	3.61	0.49	Highly complied
12.	Proper address of workers demand on health and safety promotion.	2.97	0.73	Complied

Key:  $N_1$ =Number of professional and workers in the building construction industries in Abuja Metropolis,  $X$ = Mean responses of the professional and workers in the building construction industries in Abuja metropolis.

The analysis of the result in Table 2 shows that the respondents agreed with all the items in the questionnaire on the level of compliance with health and safety plan on roof work by construction site in Abuja Metropolis with the mean were within the real limit of 2.96 to 3.37, 3.57 to 3.61. The standard deviations ranges from 0.49 to 0.75, signifies that the respondents were closer to one another in their responses to the items.

### Hypothesis One

There is no significant difference in the mean responses of the respondents on the level of compliance with health and safety plan on scaffolding by building construction site in Abuja Metropolis.



**Table 3 t-test analysis of significant difference in the mean responses between respondents in Abuja construction site as regards to the level of compliance with health and safety plan on scaffolding by building construction site in Abuja Metropolis.**  
 $N_1=52, N_2=75$

Construction Industries	N	Mean	S.D	df	Z	P-value
Professionals	52	3.38	0.17	335	2.61	0.10
Workers	75	3.32	0.21			

Table 3 shows the t-test analysis of difference in the responses of professional and site workers of building construction industries in Abuja metropolis as regards to the level of compliance with building project health and safety plan on scaffolding. The table revealed that the probability value obtained was found to be 0.10 which is less than the probability value of 0.05 in comparison, the null hypothesis was therefore rejected which means that there is a significant difference between the mean responses of professional and site workers in Abuja metropolis as regards the level of compliance with building project health and safety plan on scaffolding

**Hypothesis Two**

There is no significant difference in the mean responses of the respondents on the level of compliance with health and safety plan on roof work by building construction site in Abuja Metropolis.

**Table 4 t-test analysis of significant difference in the mean responses between respondents in Abuja construction site as regards to the level of compliance with health and safety plan on roof work by building construction site in Abuja Metropolis**  
 $N_1=52, N_2=75$

Construction Industries	N	Mean	S.D	df	Z	P-value
Professionals	52	3.41	0.19	335	5.59	0.00
Workers	75	3.26	0.19			

Table 4 shows the t-test analysis on the responses of professional and site workers in the building construction industries in Abuja metropolis as regards to the compliance with building project health and safety plan on roof work. The Table revealed that the probability value obtained was found to be 0.00 which is greater than the probability value of 0.05 in comparison. The null hypothesis was therefore accepted which signifies that there is no significant difference in the mean responses of the professional and site workers on the level of compliance with building project health and safety plan on Roof work.

**Discussion of Findings**

Finding on the level of compliance with health and safety plan on scaffolding by building construction site in Abuja Metropolis revealed that, erection of scaffold under the supervision of competent personnel was not properly complied. This finding is not in support of OSHA (2013) that said scaffold should be erect, altered or dismantled only by competent personnel. Morgarka and Varghese (2012) reported that workers fall from scaffold when components fail, handrail give way, planks break and scaffold support-collapse. They added that many construction accident are caused by deficiencies in scaffold designed and erection. This finding also revealed that the up right of the scaffold are mounted on proper base plate in order to prevent slipping or sinking, are not properly complied with by the construction industries in Abuja metropolis.

Finding on the level of compliance with health and safety plan on roof work by building construction site in Abuja Metropolis, revealed that proper crawling of ladders to work on roof slopes of more than 10 degree, and the use of sufficient guard rails and toe board for roof work are not properly complied with, this finding is supported by Health and Safety Authority (HSA)(2017) who stated that on most sloping roofs, crawling board and suitable ladders are essentials in addition to the head protection. This finding is also in agreement with Muiruri & Mulinge (2014) says that crawling board and roof ladders should be properly designed and constructed, and not made up from odd material found at the site. That board should have cross battens at least 380mm apart and should be secured in position. The ridge anchorage or the ridge iron at the top of the board or ladder should not rely on the ridge capping which is liable to break away, but should bear on the opposite slope of the roof, or be secure by a rope, Eave gutters should not be used as a footing or to support a roof ladder as they are not strong enough to bear the expected weight.



## Conclusion

Based on the findings of the study it was concluded that construction industries in Abuja Metropolis are highly complied with erection of scaffolding under the supervision of competent personnel, proper access to all parts of scaffold platform and upright of scaffold are mounted on proper based plates in order to prevent slipping or sinking. Also there is a significant differences in the mean responses between respondents on the level of compliance with health and safety plan on scaffolding in building construction site in Abuja Metropolis. The implication of the findings is that, the management staff of the building construction industries should create awareness on the implication of safety negligence on the building construction sites, as vast majority of accidents are due to noncompliance to safety rules violations. Nevertheless, the findings are limited to building Scaffolding and roof works in Abuja Metropolis. Therefore, it is concluded that, Government should provide appropriate inspection services and enforce compliance and the application on compliance to health and safety in all building construction site in Abuja Metropolis.

## Recommendations

Based on the findings from the study, the following recommendations were made:

1. Government should supervise compliance with health and safety plan on the use of scaffolding by building construction site in Abuja Metropolis.
2. Health and Safety Plan rules should be properly complied with when crawling of ladders to work on roof slopes and the use of sufficient guard rails and toe board for roof work.
3. Government should create awareness on the implication of Health and Safety negligence on the building construction sites, as vast majority of accidents are due to noncompliance to safety rules violations.

## References

- Agwu, M. O. & Olele, H. E. (2014). Fatalities in the Nigerian Construction Industry: A Case of Poor Safety Culture. *British Journal of Economics, Management & Trade* 4(3), 431-452.
- Awodele, O. A. & Ayoola, A. C. (2012). An Assessment of Safety Programs on Construction Sites. In: *Journal of Land Use & Development Studies*, 1(1), 1-13.
- Hawkins D. M. (2012), AIA, LEED AP of Preservation Design Partnership, LLC in Philadelphia, PA. *New Orleans: Springer*.
- Mattison, K. (2011). The cost of cheap building materials. *Benchmark Roof and Pavement Consultants*, 2(69), 1-10.
- Mogarkar, V. & Varghese, D. (2012) "A concept for development, safe erection and use of scaffolding for high rise buildings". *International Journal of Innovative Technology and Exploring Engineering (IJITEE)*, 2(1), 224-226.
- Muiruri, G. & Mulinge, C. (2014). Health and Safety Management on Construction Projects Sites in Kenya, A Case Study of Construction Projects in Nairobi County, Engaging the Challenges Enhancing the Relevance, 16-21.
- Occupational Safety and Health Administration (OSHA) (2016). *Trenching and Excavation Safety*, Washington: Jossey bass.
- Olanrewaju, A. L., & Abdul-Aziz, A. R. (2015). Building Maintenance Processes, Principles, Procedures, Practices and Strategies. In *Building Maintenance Processes and Practices* Springer Singapore, 1(2), 79-129.
- Williams O. S, Hamid A. R. & Misnan, M. S. (2018). Accident Causal Factors on the Building Construction Sites: A Review. *International Journal of Built Environment and Sustainability (IJBES)*, 5(1), 78-92.