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An Assessment of Site Layout Practices of Construction Projects in Nigeria

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ABSTRACT

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Keywords: Site Layout; Facilities; Management Practices; Construction Projects; Nigeria

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AN ASSESSMENT OF SITE LAYOUT PRACTICES OF CONSTRUCTION PROJECTS IN NIGERIA

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Abstract

Site layout has been identified an integral segment in the design and construction process, however their practices has been an issue in the Nigerian construction industry, especially among small and medium sized firms. Therefore, the research seeks to assess the site layout practices of construction project in Abuja, Nigeria with a view to improve productivity on construction projects. The research reviewed literatures on site layout practices and a survey made questionnaire was designed for the respondents, to determine their level of participation in site layout and the practises involved. The respondent of the questionnaires are construction professionals functioning at managerial level. The sample size for the research was calculated and a respondent of seventy one (71) was determined. Data was analysed using statistical tools such as mean, percentage and relative importance index and the information was presented in charts and figures. From the research finding, 'preparing site layout design before the commencement of site work' ranked first with (RII) value of 0.785, which is very significant. The research concluded that the major site layout practice is the preparation of site layout design before the commencement of site work. It recommends that further studies should focus on the design considerations and processes involved in the implementation of site layout plan in construction projects.

Keywords: Site Layout, Facilities, Management Practices, Construction Projects, Nigeria

1. Introduction

According to [1], the construction industry which is one of the most important sector of most national economy run into trouble majorly because of managerial factors rather than technical problems. The site-based management can make significant improvements in the cost and time savings during the construction process without involving a mass of additional work. The role of site managers is to control and maintain work performance and then taking actions to rectify situations where performance is unsatisfactory. Safety and accessibility should be given more consideration in site planning and also the designing of path for movement of transport rather than to limit the consideration only to distance and cost [2].

Among the important tasks of site management is the site layout planning. Extensive time loss and cost overruns could result in large projects, where the number of

manpower, subcontractors, and equipment involved are high, if there is no effective and systematic approach to site planning. A detailed planning of the site layout and location of temporary facilities can enable the management to make considerable improvement by minimizing travel time, waiting time, and increasing workers morale by showing better and safer work environment [3]. Construction site layout planning has been recognised as a critical step in construction planning, the basic function of the process is to find the most suitable arrangement for the positioning of the temporary facilities. Temporary facilities have to be placed right from the beginning of the project construction to the completion [4]. Due to the importance of site layout practice of construction project, this research will give emphasis on site layout practices of construction projects.

Site managers mostly abandon site layout design right from the inception of the

construction project thinking that it will be done as the construction project progresses. It is important to realize that the site planning will be the conditions that site personnel will live with for the total duration of the construction period. Thus, careful pre-planning is imperative. Also, since the labour cost on a large project constitutes approximately 50 to 60 percent of the total project cost, significant saving can be made if the labour force moves freely and quickly within the site. According to the Construction Industry Institute of Geneva, this reported in its “Constructability Concepts File” that temporary facilities are important elements that can either enhance or adversely affect construction productivity [5].

Construction project site layout involves the identification, sizing, and placing of the temporary facilities (TFs) at the required positions within the boundaries of the construction project site. These temporary facilities may range from simple lay-down areas to warehouses, fabrication shops, maintenance shops, batch plant, and residence facilities. Required temporary facilities and their areas are depending in many factors including project type, scale, design, location, and organization of construction work [6].

Site layout planning, in general, can be viewed as a complex problem that has many effects on construction project productivity, ranging from the site layout of small construction project to the site layout of large construction project. This problem has to be extensively addressed with respect to this research.

Efficient layout planning of a construction site is fundamental to any successful project. This usually consists of identifying the temporary facilities needed to support construction operation determining their size and shape and positioning them in the unoccupied areas within the site boundaries [7]. Examples of these temporary facilities

include offices and tool trailers, parking lots, warehouse, batch plant, maintenance areas, fabrication yards or buildings, staging areas and lay down areas. The project manager or planner usually performs the task of preparing the site layout based on his/her own knowledge and expertise. Apparently, this could result in layout that differ significantly from one person to another. To put this task into more perspective, researchers have introduced different approach to systematically plan the layout of construction site [7].

Therefore, the research seeks to assess the site layout practices of construction project in Abuja, Nigeria with a view to improve productivity on construction projects.

2. Literature Review

Characteristics of Site Layout Facilities

construction site facilities for a good site layout design are usually have a specific work target and operation nature in which they still have some common characteristics as follows.

- a. Essentially not easy to be substituted for carrying out specific construction work.
- b. These temporary facilities are by their nature being temporary as the name implies.
- c. The facilities should be properly located when positioning. In addition, if they are not positioned well they affects the efficiency of the construction productivity.
- d. If these temporary facilities are not positioned properly by use of effective site layout design, therefore the facilities may occupy significant workspaces and may affect the regular project of some major construction activities that are taking place.
- e. These facilities should meet requirement for relocation and meet the advancement of works and progress of construction.
- f. These facilities should meet requirement like safety, operational and structural concern.
- g. The provision of maintenance and the installation of these temporary facilities can

be quite timely and costly, thus the provision, relocation and maintenance and also dismantling of these facilities should be well planned in a very careful manner in order not to interrupted with the site layout design master plan of the construction project site [8].

Site Layout Planning Element

A well planned site, which comprises of all temporary facilities and utilities lead to

- i. Increasing productivity and safety.
- ii. Reducing areas needed for temporary construction and maximizing utilization.

The following elements should be considered in good site layout [9].

Site aaccessibility

Good and very easy accessibility will keep the morale of the equipment and the drivers of the vehicle, high minimization of the chances for the occurrence of accidents, and also save time in manoeuvring to arrive at and leave the project in a very good time. In case of large projects, proper planning is required to set the layout of roads which will lead from the nearest high. Internal roads are necessary for easy flow of vehicle as well as the flow of the work itself. And also parking lots are provided for the owner, office and craft personnel, but this facility must be planned where space does exist [9].

Security

It is very necessary to have a proper guard at the entrance of the construction project site. It should be provided by a booth also, it is necessary to keep track of all visitors entering in to the construction project site. Lighting is necessary to have a stand by generator for site lighting, fencing is necessary from the security check point to the entire site boundary [9].

Safety

The prevention of fire and other hazard that may arise at construction project site is every important. Fire outbreak is a major cause of damages at construction project

site. In this regards provision of fire extinguishers at construction project site is necessary because they are the basic requirements for the safety of fire [1].

Information signs

Site map is very necessary at construction project site to show the details of the project by displaying it in the construction project site office and at the entrance gate. This should be done by the construction project superintendent or the project manager and or the site planner.

- i. **Provision of traffic regulatory signs:** Traffic regulatory signs are usually considered on large scale project so as to guide the traffic and avoid any occurrence of accidents at the construction project site.
- ii. **Display of labour and management relation:** Safety rules and policy has to be provided this will help in eliminating the disputes that may arise between labour and management.
- iii. **Provision of emergency exit notes and underground services:** It is paramount important to display the emergency escape routes on every angle and floors, as the construction operation progresses. And also indication of the points were those underground facilities are necessary.

Office

The provision of site offices for all the project stake holders is necessary. The offices to be provided should be closely together. And close to the construction operation area at the construction site and in a safe and noise free area so that to prevent the noise of machines to the office. The offices should be well required with office equipment. The stake holder's offices should include the job office, the general contractor office, sub-contractor office and the project consultant's offices.

Accommodation: For large scale construction project provision of

accommodation for all the staffs involved in the project is necessary so that the work will be progressing with respect to time. [1].

Sanitation and water supply

It is very necessary to provide and supply water to all angle of the construction project site as well as the provision of public convenient for the staff around so that they will be comfortable. [9].

Storage and site cleaning

Storage facilities have to be provided for safe storage of construction materials so that unnecessary movement of materials will be arrived. [1].

Material handling

Provisions of materials handling equipment are necessary because almost one third or more of all construction operations can be classified as material handling. The proper use of the equipment for material handling and advance planning for minimizing the multiple handling will result in direct cost and time savings. [9].

Craft change-houses

Craft men on site has to be provided with change room and restroom for waiting of work shifting as well as store for clothes storage and washing area [9] .

Batch plant and fabrication shops

Batch plants are provided on projects where it is more economical to produce concrete as in situ in construction project site than to buy a ready mix. An onsite batch plant is accompanied by Aggregate storage piles, cement silos and tank for admixtures. Shops are used where material and equipment are fabricated on site. There is need for laboratory for testing of samples. This fabrication shops should include electrical, mechanical, carpentry and paint shops etc. [4].

Provision of Site Layout Facilities According to Construction Project Stages

Construction site layout facilities for a construction project site can be further be classified based on construction stages for a particular construction project site. This depends on the type and scale of the project. Some of this classification can be as follows.

- a. At the start of the construction project: construction site layout facilities are to be set-up at the early stage of construction project undertaking. This usually include the provisions that must be provided before the effective carrying out of other major construction works or other work items that are to be demanded for concerning statutory requirements. The facilities we are referring here could be site fencing, supply and routing of the access roads the setting up for site offices for contractors and other site personnel, arrangement for the delivery and also positioning for the essential work equipment, and other provision as required by relevant statutory requirements [8].
- b. At the peak period of a construction project that is as the construction project progresses to a peak point when permanent structural works are to be executed. At this stage, the facilities to be used for the construction project progress should be more specific some of these facilities are temporary in their nature. These facilities should be the tower crane, material hoist, workers lift, and scaffold, and temporary platform, provision of access working fronts, false work or additional support to the required structures. and other equipment, And there are also mounting equipment which are mostly required for external works for buildings such as power wincher system for the installation of other finishing materials like the curtain wall units which are to be operated a temporary provided track rail. [8].

- c. At final stage of construction project, that is when finishing touching activities are on progress or other handing over preparation is to be carried out. In this stage of construction project almost all the construction site layout facilities are to be dismantle and remove away from the construction site. Some particular equipment or facilities of different type required to assist in the temporary facilities. For instance like in case of a winching machine and a lifting rod that are to erected and set on the roof level to help in the dismantling process for a tower crane and lowering its components down to the ground level for removal. And therefore provision for the touching up & maintenance of the disturbed areas after the dismantling and removal of the temporary facilities is also required [10].
- v. Handling spaces for other building materials and semi-completed components which include precast items used on site.
- b. Large scale building construction projects in particular with a very large construction project site area or involves works on site with a complicated shape or layout. This comprises for instance large scale excavation, deep trench excavation, work adjacent slope or sensitive structures either at grade or underground [8].
- c. Complicated civil engineering project and various types of large-scale construction projects, example of these types of projects which include site formation, marine works, drainage works, slope treatment water supply railway construction, highways projects, tunnels and bridge construction and other infrastructural development projects. [8].

Provision of Major Site Layout Facilities According To Types of Construction

Construction site layout facilities is relatively a general term that is used for the setting up and operation of a construction project site for the nature, scale and type of works to safely and greatly diversity from construction project site to construction project. The following are features to be highlighted based on the construction project type [8].

- a. Building construction project involve the construction of super high rise storey building, towers in a relatively confined site the construction site layout facilities for project of this nature should include [8].
 - ii. Facilities and work spaces for construction material delivery or placing of concrete
 - iii. Crane tower is to be assisted for construction activities that are situated at the top floor level
 - iv. Hoisting equipment that is used in materials delivery or components which are structurally completed at various floors.

Provision for site layout temporary facilities for civil work projects are often in a highly dynamic nature due to the involved works that are mainly in a horizontally spread layout without a lot of tall and independent structures. The facilities and equipment needed for project of this nature are very heavy duty materials for the requirement to handle huge amount of materials or very heavy components or for the supporting of very large loading, very large operating spaces with additional equipment are normally required for the erection, manoeuvring operation and dismantling of these facilities. [8].

The following are example of some temporary facilities used in civil engineering works [8].

- i. Machines access road or worker manual, these accesses can be erected. Over large area that in undulating, down to deep excavation pit climb to great height or span between tall structures

- e.g. bridge towers, or provide access to very steep slope.
- ii. Provision of equipment for the transportation and lifting of bulky or very heavy materials such as the spoil materials for excavation for structural steel, precast or semi completed components. These materials can weigh up to hundred tons. The hundred equipment, for instance the various types of work machines for earth-work conveyors systems, cranes, launching equipment portal frame, hydraulic trolley or jack systems etc. sometimes, such provisions may even include the setting up of temporary facilities such as pier for marine works or for the delivery of large and heavy materials transported to site by sea. And of course, an appropriate access routing should also be provided for the working and handing of the equipment.
- iii. False work system for various purposes such as support for temporary work platform for machine stationing for material handling and for storage facilities, provision of additional work spaces (elevated or suspended) so as to give support to lay span reinforced concrete structure which in constructed is an in-situ manner support for a working platform over an open-cut basement excavation pit or as support to freshly concreted structures which are prepared for the temporary placing of additional loading.
- iv. Site layout and equipment for large scale earthworks, site formation for foundation works. A large number of very large work machines such as excavator, dumper trucks, graders, rock crusher, conveyor, drilling machine, piling rack for foundation large climates piling equipment are involved in these kinds of projects. This equipment here are often used in a difficult topographic condition mostly in remote areas, where in accessibility problem for the delivery of machines or even removal of excavated spoil away from the site. or

the work spot these machines are used and removed later in the earliest time they are mostly stationed in a location and removed in short period of time this is done when the work has been completed for progress of other works on site

- v. Equipment for specialized construction works such as launching of gantry for the construction of viaduct or elevated bridges, Tunnel Boring Machine (T.B.M), travelling of form work systems or the equipment for tensioning works etc. This equipment used for this purpose are usually very large sized and also very heavy in weight. They usually require a very large working area to place and consume time so as to place to a required location so that work will take place. These equipment has a lot of features [8].

3. Research Methodology

3.2 Research Method Adopted for the Study

The research involve answering question relating to site layout practices, and hence will use descriptive and case study approaches of carrying out research as described in Abdulazeez [11]. These form of research assess the practices of site layout practices as it relates to

3.3 Population and Sample

The population of this study consist majorly of the management of large construction firms in Abuja metropolis. This construction companies cuts across both those involved in building and civil works. The population size of the study is denoted by (**N**). The research used purposive sampling technique, which consist of construction companies in Abuja. A well-structured questionnaire was given to the management of these large construction firms to achieve the listed objectives of the research. The sample size of the study is denoted by (**n**).

The sample size is determined by using the Kish [12] formulae which is described as follows:

$$n = \frac{M}{1 + \frac{M}{N}}$$

Where n = sample size

N = total population

$$M = \frac{s^2}{V^2}$$

V = standard error of the sampling distribution

S = standard deviation of the population element

Using a total error of 0.1 at 95% confidence interval

V is 0.05 and P is 0.5

$$S^2 = 0.5 \times (1 - 0.5) = 0.25$$

N = 245. (Number of registered construction companies based in Abuja, according to C.A.C 2014.)

$$M = \frac{0.25}{0.0025} = 100$$

Hence

$$M = 100$$

$$n = \frac{100}{1 + \frac{100}{245}} = 71$$

Therefore the sample size (**n**) for the survey is found as 71. This implies that 71 questionnaires would be distributed across the construction companies based in Abuja.

Data collection technique

The questionnaire distributed to the large construction firms will be used in obtaining the research data as well as interviewing the respondents in order to gather information regarding to site layout design and management practices in large construction sites.

Administration of data collection instruments

Questionnaire will be administered to management staffs of the selected construction companies in the study area.

Data analysis technique

The research used the statistical package for social sciences (SPSS) as a tool in carrying out the statistical analysis for this study, which will act as both a descriptive and inferential tool.

Relative Importance Index (RII)

Relative importance index was used in the study to rank the site layout design practices of construction projects in Abuja.

$$\text{Relative Importance Index (RII)} = \frac{\sum fx}{\sum f} \times \frac{1}{k} \text{-----} 1.4$$

Where,

$\sum fx$ = is the total weight given to each attributes by the respondents.

$\sum f$ = is the total number or respondents in the sample.

K = is the highest weight on the likert scale. Ranking of the items under consideration was based on their RII values. The item with the highest RII value is ranked first (1) the next second (2) and so on.

The rating of all the factors for degree of significance was based on the value of their respective relative importance index (RII). The guide for the rating is given in Table 1.1 below:

Table 1. Guide to degree of significance

Degree of significance	Rating
Very significant	0.76 above
Significant	0.67-0.75
Fairly significant	0.45-0.66
Not significant	0.44 below

Source: Vanduhe [13]

4. Findings and Discussion

This part of the study deals with the presentation and interpretation of data obtained from the field survey, analysis of the data and discussion of findings as they relate to the objectives of the study.

Table 1: Breakdown of Questionnaire

	Respondents
No. Distributed	71
No. properly filled and returned	39
Percentage response	54.9%

Source: Field survey (2015)

From Table 4.1 seventy one (71) questionnaires were administered, thirty nine (39) questionnaires were returned. Based on the assertion of Moser and Kalton [14], the result of a survey could be considered significant if the response rate is not lower than 30-40%. Therefore, the percentage of the returned questionnaires is adequate for analysis.

Company Information

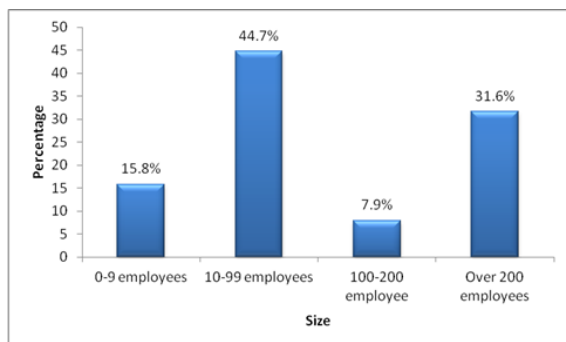


Figure 4.1: Size of the Company

Figure 4.1 shows the size of company, some companies have employees ranging 10-99 (44.7%). While those with employees between 100-200 have the lowest percentage of 7.9%. This implies that 44.7% of the construction companies have 10-99 employees. This may lead to under staff of workers in the construction company.

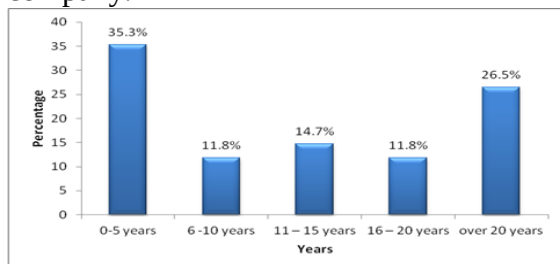


Figure 4.2: Years of Working Experience of Firm

Figure 4.2 shows the various years of experience of the construction firms, were by majority of the firms has 0-5years of working experience which result to 35.6% while the minority has 6-10years and 16-20years of working experience which result to 11.8% for both respectively. This may implies that 35.3% of the construction companies does not have much experience

unlike those that have experience of over 20years with a percentage of 26.5%.

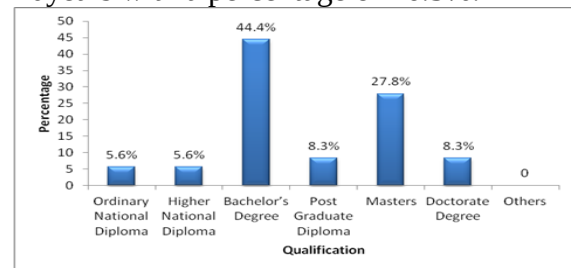


Figure 4.3: Highest Academic Qualification

Figure 4.3 shows the highest academic qualification of the staff in the construction project site, in which majority of the staff has bachelor's degree which result to 44.4% which implies that the construction companies have high number of professionals with bachelors' degree. While the minority has ordinary national diploma and higher national diploma which result to 5.6% for both respectively. While 8.3% of the construction companies have employees with doctorate degree this may be as result of lack of affordability by the construction companies to utilise much employees with doctorate degree in the construction companies.

Involvement of Construction Companies in Site Layout Practices

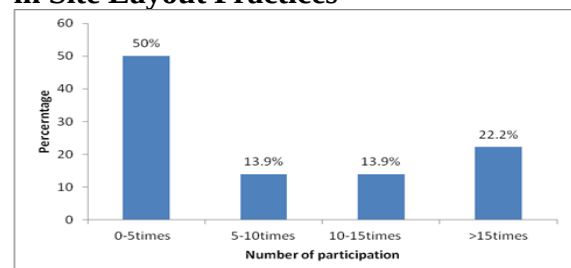


Figure 4.4 Number of Times of Participation in Designing Site Layout

Figure 4.4 shows the number of participation of the staff in designing site layout in which majority of the staff falls between 0-5times in designing site layout which result to 50% which implies that about half of the staff participated 5times or below. While the minority of the staffs' falls between 5-10times and 10-15times which result to 13.9% for both respectively. This may simply shows that majority of the

employees in the construction companies does not have much experience in designing site layout.

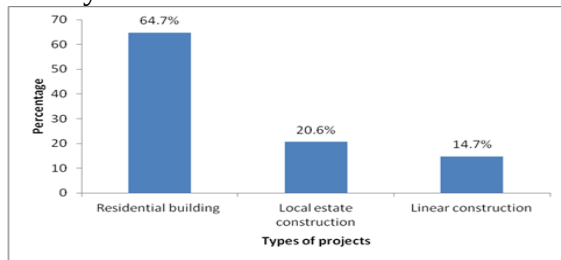


Figure 4.5 Type of Project with Site Layout Design

Figure 4.5 shows the type of project with site layout design, were as the majority of construction firms do site layout design for residential building construction project which result to 64.7% while the minority of the construction firms do site layout design for linear construction, which result to 14.7%. This may implies that majority of the construction companies does mostly building construction in which they may be have much experience upon.

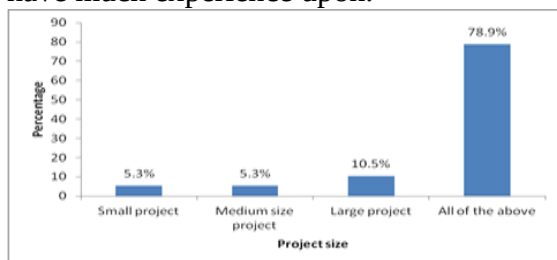


Figure 4.6 Project Size in Planning of Site Layout Design before the start of Construction Project

Figure 4.6 shows the project size in planning of site layout design before the start of construction project, were as majority of the firms does site layout design for small, medium and large project which result to 78.9% which while the minority does for small and medium size project which amount to 5.3% for both small and medium size respectively. This may implies that majority of the construction company does site layout design for all the kind of construction.

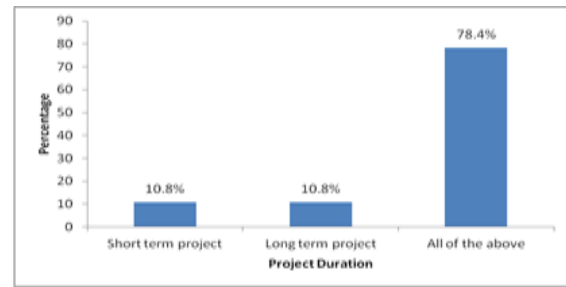


Figure 4.7 Project Duration in Site Layout Design in Construction

Figure 4.7 shows the project duration in site layout design in construction project, were by majority of the construction firms does site layout for both short and long term project which result to 78.4%. While half of the minority does site layout design for short term and the other half does for only long term duration project, in which it result to 10.8% respectively. Since the majority of the construction companies does site layout design for both short term and long term construction project this may be due to their consistency in construction.

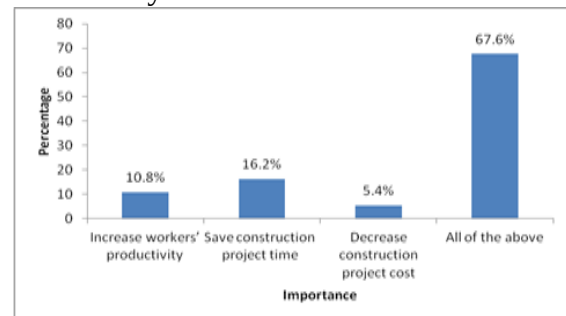


Figure 4.8: The Importance of Site Layout Design

Figure 4.8 shows the importance of site layout design, the majority of the construction firms benefits from all the importance of site layout design which leads to 67.6% while the minority benefits from only decrease in construction project cost, which leads to 5.4%. As the majority of the construction companies benefit from all the three importance of site layout design this may due to effective and proper use of their site layout design in the construction project sites.

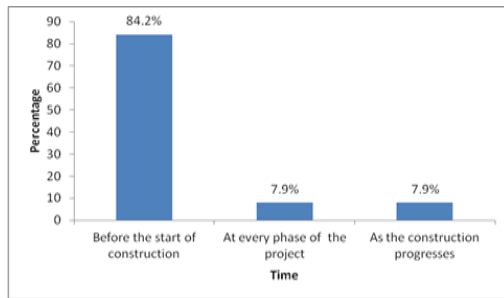


Figure 4.9 Time to Provide Site Layout Design in Construction

Figure 4.9 shows the time in which site layout design is to be provided, majority of the construction firms provide site layout design at the beginning of the construction project which result to 84.2%. While half of the minority provide site layout design at every phase of construction project and the

4.4 Site Layout Practices

other half provides as the construction project progresses which result up to 7.9% respectively.

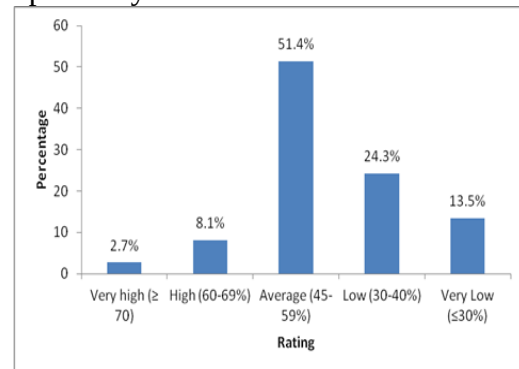


Figure 4.10: Level of Participation of your Engineers or Planners in Designing Site Layout.

Table 4.2: Site Layout Practices

S/No	Practices	Frequency of responses					Σf	Σfx	Mean	RII	Position
		1	2	3	4	5					
1	Preparing site layout designs before the commencement of site works	1	2	5	13	17	38	157	3.9	0.7	1st
2	Ensuring good positioning system for the temporary facilities.	3	5	5	16	7	36	127	3.1	0.635	7th
3	Construction of fence at the boundaries of construction site.	3	4	6	9	16	38	145	3.625	0.725	3rd
4	Provision of the public convenience for workers on site.	5	6	6	9	9	35	116	2.9	0.58	11th
5	Provision of canteen for workers meals at site	5	9	11	10	3	38	111	2.775	0.555	13th
6	Provision of workers recreational facilities	14	13	5	3	1	36	72	1.8	0.36	20th
7	Provision of first aid centers for workers emergency responses.	4	7	8	11	8	38	126	3.15	0.63	8th
8	Provision of access roads for trucks and light weight vehicle.	3	1	9	12	12	37	140	3.5	0.7	5th
9	Provision of site offices for clients, contractors and consultants.	2	2	8	14	12	38	146	3.65	0.73	2nd
10	Provision of security office	3	4	9	9	13	38	139	3.475	0.695	6th
11	Provision of security check points	8	7	14	4	2	35	90	2.25	0.45	18th
12	Provision of site clinic	12	9	12	2	2	37	84	2.1	0.42	19th
13	Provision of fire prevention and fire fighting equipment	6	9	11	7	5	38	110	2.75	0.55	13th
14	Provision of information signs and signals	4	4	10	13	6	37	124	3.1	0.62	10th
15	Provision of site map showing the site and temporary facilities	7	6	13	8	3	37	105	2.625	0.525	16th
16	Provision of traffic signs	6	8	11	7	5	37	108	2.7	0.54	15th
17	Provision of safe and safety equipment	1	7	6	18	4	36	125	3.125	0.625	9th
18	Provision of accommodation for site workers.	7	11	4	6	8	36	105	2.625	0.525	16th
19	Provision of site stores	4	2	5	13	14	38	145	3.625	0.725	3rd
20	Provision of fabrication and maintenance shop.	6	7	12	8	5	38	113	2.825	0.565	12th

Not applicable=1, low level of application=2, moderate level of application=3, High level of application=4, Highest level of application=5

Figure 4.10 shows the level of participation of your engineers or planners in designing site layout, majority of the engineers and or planners of the construction firms have averagely participated in designing site layout which result to 51.4%. While minority of the engineers and or planners have participated very high as in participating severally in designing site layout which result to the lowest percentage of 2.7%. As the majority of the engineers in the construction companies averagely participated in designing site layout this may be due to their years of experience of work at all.

Table 4.2 shows components of good site layout practice. 'Preparing site layout design before the commencement of site work' ranked first with (RII) value of 0.785 which is very significant. This implies that the construction companies prepare site layout design very well before the start of construction project; 'Provision of site offices for clients, contractors and consultants', ranked second with (RII) value of 0.73 which is significant. This implies that the construction companies practiced the provision of site offices for clients, contractors and consultant. 'Construction of fence at the boundaries of construction site', and 'provision of site stores' both ranked third position with (RII) value of 0.725 which are also significant. Which implies that they practiced it very well 'provision of access roads for trucks and light weight vehicle' is ranked as fifth position with RII value of 0.7 which is significant. This shows that the construction companies provide access roads for trucks and light weight vehicle very well. 'Provision of security office', ranked sixth position with (RII) value of 0.695 which is significant. This implies that the construction companies do the provision of security office very well. 'Ensuring good positioning system for the temporary facilities', ranked seventh with (RII) value of 0.635 is fairly significant, which implies that the construction companies fairly does

good positioning system of the temporary facilities. 'Provision of first aid canter for workers emergency responses' ranked eight positions with (RII) value of 0.63 which is also fairly significant. This shows that the construction companies fairly provide workers emergency responses i.e. first aid centre 'Provision of safe and safety equipment,' ranked as the ninth position with (RII) value of 0.625 which is fairly significant. Which implies that they fairly provide safe and safety equipment. 'Provision of information signs and signals' ranked as the tenth position with (RII) value of 0.62 which is also fairly significant. This is also considered as fairly practiced by the construction companies. 'Provision of workers recreational facilities ' ranked as the last position with (RII) value of 0.36 which is not significant. This implies that the construction companies do not practice the provision of workers recreational centres.

From the result obtained above it can be inferred that good site layout practice is majorly preparing site layout design before the commencement of site work, which takes care of the planning of activity on construction sites and controls movement on the site. The Provision of workers recreational facilities did not have significant impact on good site layout practice because it does not directly affect construction site activity.

5. Conclusion and Further Research

From the research it can be concluded that the construction companies are involved in site layout practices, usually at the beginning of every project, and they are reviewed between one to five times during the life of the project on a basis of short and long time. The engineers and planners are key players in the design of site layout plan and it can also be concluded that the major site layout practice is the preparation of site layout design before the commencement of site work.

The research therefore recommends that further studies should focus on assessing the duration of site layout plans in the life cycle of the project, and the roles of the professionals in the design and implementation of site layout plan. It also recommends that further studies should focus on the design considerations and processes involved in the implementation of site layout plan in construction projects.

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