

KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY

KUMASI, GHANA

**Assessment of Operatives Adherence to Health and Safety Regulations on Building
Construction sites in Ghana.**

(A case study in Accra)

by

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**A Thesis submitted to the Department of Building Technology, College of Art and
Built Environment in partial fulfillment of the requirement for a degree of**

MASTER OF SCIENCE

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DECLARATION

I hereby declared that except from this submission is my work towards MSc. Construction Management and that to the best of my knowledge it contains no material previously published by another person nor material which has been accepted for the award of any other degree of the university except where due acknowledgement has been

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ABSTRACT

The second largest industry in Ghana to the manufacturing industry is construction and it employs a large workforce which most times becomes difficult for the employers to achieve their goals and objectives due to problems of safety of operatives. The construction industry provides the homes we live in, the buildings we work in and the transport infrastructure we rely upon. However, for many operatives and their families and friends, involvement in the construction industry leads to the unimaginable pain and suffering associated with an accidental death or serious injury as a result of not being protected properly. This study aims to explore the extent of operatives' adherence to health and safety regulations with its objectives being to identify measures in place to enhance adherence as well as health and safety regulations adhered to by operatives. The general methodology of this study relied largely on the survey using questionnaires which were administered to operatives within the construction industry. A thorough literature review was initially conducted by using references from journals, text books, handouts, leaflets, and also browsing of construction websites to be abreast with what other authors think about this study. In total, fifty questionnaires were distributed: forty were collected for the analysis which helped in the data analyses. The study revealed that several control and preventive measures were being put in place to enhance the adherence by operatives and it is in conformity to the laws provided by the Labour Act 2003 (Act 651), Workmen Compensation Act, 1987 (PNDC Law 187) and the Factories, Offices and Shops Act, 1970. The study therefore recommends several or numerous measures or policies that can be put in place to enhance the adherence by operatives on the construction sites in Ghana.

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May the almighty God richly bless us all.

DEDICATION

I dedicate this project report to the Almighty God and my one and only wife, Mrs. Mary Takyiwaa Danso Boateng for her great effort and tireless prayers that has brought me this far. May the good God continue to give you more strength to enjoy the fruit of your labour.

CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND OF STUDY

Construction of building in general is a hazardous and tedious task yet majority of building construction organizations in Ghana seem not to take appropriate and adequate measures to safeguard the health and safety of operatives being employed on the site. Due to this, constructions therefore become very dangerous in attempt to execute the various activities in the industry.

In carrying out certain tasks, the construction worker, in this context, operative is subjected to potential harmful conditions such as, height, heavy loads, massive explosive equipment's, handling, carrying and transportation of materials which are very hazardous to the health of the operative. In the process of erecting a structure, being large or small, several hazardous situations occur such as unprotected openings within various levels of suspended floors, lack and inadequate support to earthworks, improper secured scaffolding works which may sometimes be constructed using defective materials, no personal protective equipment and numerous other hazards.

To be able to provide a safe working conditions for the construction operative demand a lot of vigilance which is the responsibility on the part of the design team, contractor and site management. They are to put in the necessary requirements of training modules and programs and as a matter of fact see to its adherence, implementation and maintenance on a construction project site in a reasonable manner. Unfortunately, this vigilance to safety

regulations appears to be given no or little attention on many construction sites, resulting in frequent occurrence of accidents in several construction sites in Ghana. Hazards can therefore be reduced to a minimum if proper safety techniques followed and adhered to and also implemented base on a well-organized and defined occupational health and safety programs.

1.2 PROBLEM STATEMENT

The second largest industry in Ghana to the manufacturing industry is construction and it employs a large workforce which most times becomes difficult for the employers to achieve their goals and objectives due to problems of safety of operatives.

The construction industry provides the homes we live in, the buildings we work in and the transport infrastructure we rely upon. However, for many operatives and their families and friends, involvement in the construction industry leads to the unimaginable pain and suffering associated with an accidental death or serious injury as a result of not being protected properly.

Much as accidents and hazards on the construction operatives cannot be eliminated totally, measures can be adopted to reduce risks to the barest minimum. Prevention of these accidents and occupational diseases require an exact knowledge of the sequence of causes and by so doing the necessary precautionary measures chosen and applied strictly. Due to the constant changes in technology and the introduction of new materials, equipment and methods into the construction industry, operatives are exposed to varying hazards many of whom we have no idea what so ever of the effects associated with them.

It is therefore in light of this that the researcher has taken the mantle to assess the safety of building operatives in Ghana (Accra metropolis.)

1.3 AIM AND OBJECTIVES OF STUDY

1.3.1 AIM

The main aim of the study explores the extent of operatives' adherence to health and safety regulations on site.

1.3.2 OBJECTIVES

The objectives of this study are outlined below:

- To identify the measures in place to ensure health and safety regulations are adhered to by operatives
- To identify health and safety regulations adhered to by operatives.

1.4 RESEARCH METHODOLOGY

The study began with an extensive literature review with reference from journals, text books, handouts, leaflets and also browsing of construction websites. A designed questionnaire was administered to solicit information from persons within the construction industry. Primary and secondary data were also used to collate needed information regarding the study. Analysis of the study was carried out using descriptive statistical tool such as the tabular analysis where responses were spread in percentages.

1.5 SCOPE OF STUDY

This study concentrated on selected building construction sites in Accra Metropolis.

1.6 LIMITATIONS

The researcher encountered some barriers and they are the following:

1. The unwillingness of people in positions to give concrete and valid information and in some cases refused to furnish the researcher with documented information relevant to the study.
2. The appreciation of the relevance of the survey to the respondents

1.7 SIGNIFICANCE OF THE STUDY

Due to the constant changes in technology and the introduction of new materials, equipment and methods into the construction industry, operatives are exposed to varying hazards many of whom we have no idea whatsoever of the effects associated with them. The research seeks to explore the extent of operatives' adherence to health and safety on building construction site.

1.8 ORGANISATION OF THE STUDY

The research is organized into five chapters as follows:

- ❖ Chapter one is devoted to the general introduction of the study, problem statement, aims and objectives of the research and research methodology adopted.
- ❖ Chapter two is devoted to the literature search and touched on areas like Health and Safety regulations in Ghana, Workmen's Compensation act 187, Labour law act, 651, and Factories, offices and shops act, 1970.
- ❖ Chapter three is devoted to the methodology and entails a description of the research method used in this study.

- ❖ Chapter four is devoted to analysis of data collected and discussion of results.
- ❖ Chapter five is devoted to conclusion of the findings of the research, recommendations and further research.

CHAPTER TWO

LITERATURE REVIEW

2.1 INTRODUCTION

Construction sites are known for high rate of occupational accidents, which present the field as one of the most dangerous workplace on earth (I.L.O., 2005). In order to ensure the strict adherence to healthy and safe practice on building sites, certain standards need to be ensured by all and sundry found on building sites. The Williams-Steger Act, better known as the Occupational Safety and Health Act (OSHA) spells out safe working conditions. OSHA requires that contractors provide safe and healthy working environment for all workers on sites. Thus, this research intends to examine the extent of operatives' safety against building construction activities.

2.2 SAFETY ASSESSMENT ON SITE

According to Timbermat Ltd, (2011), safety assessment need to be undertaken prior to the beginning of any work on site to ensure that, visitors and construction works are safe. The same author indicated the essence of basic health and safety practices. He opined that, management should ensure the availability of fully equipped first aid box and fire extinguishers. It should be easily accessible and workmen should be trained to use these tools when the need arises.

In situations where lift/escalator works is to be undertaken, an initial site safety survey must be conducted by a competent personnel before the work on the lift/escalator begins. The personnel to conduct this survey should be a safety expert or an experienced engineer with sufficient knowledge on safety and health at lift and escalator works. After the

survey is conducted, safety and health issues should be identified and recorded (The Real Estate Developers Association of Hong Kong et al, 2005).

2.3 HEALTH AND SAFETY LEGISLATION

There are two main health and safety legislation that affects educational establishment across UK. These legislations set the standards that must be followed to maintain health and safety of all employees and personnel affected by any work activity. These legislations are Health and Safety at Work, etc. Act 1974 and the Management of Health and Safety at work Regulations 1999. Other set of rules are there to cover special risks like lifting and carrying, computer work and electricity (H. S. E, 2003).

There are various aspects of health and safety legislation which apply across the full range of workplace as shown in the appendix of this study

2.4 SAFETY AND HEALTH REGULATIONS IN GHANA

Legal regulations issues of safety at workplaces in Ghana are covered under Part XV of the Labour Act, 2003 (ACT 651). This Act applies to all employers and employees except the Ghana services employees such as the Armed Forces, the Police Service, the Prison Service and the Security and Intelligence Agencies specified under the Security and Intelligence Agencies Act 1996 (ACT 526), Section XV.

The Labor Act, 2003 (ACT 651) provides a number of legislation for legal basis for health and safety issues in Ghana. These are;

- General Health and Safety Conditions (Section 118)
- Exposure to Imminent Hazards (Section 119)

- Employer to Report occupational accidents and diseases (Section 120)
- Specific measures (Section 121)

Details of these sections can be found in the appendix of this study.

2.4.1 Workmen's Compensation Act (law), 1987(PNDCL 187)

The P.N.D.C government in 1987 passed this law which relates to compensation for personal injuries caused by accidents at work and hence, indirectly impacts on monitoring worker and workplace safety. This Act also compels all employers to make reports of all accidents to the nearest Labor Department.

2.4.2 Factories, Offices and Shops Act, 1970

This act compels employers (contractors) to make work place safe. It places burden of provisions of safety measures and control on the contractor. Also known as Act 328 and it states that:

- i. The employer shall make reasonable provision for the safety and health needs of employees. The employer shall provide adequate protection and safety equipment and this will remain the property of the employer.
- ii. Management shall provide dust mask for workers on the road and in the dusty sites, including quarries and those who work with cement and petroleum product.
- iii. Protective or safety equipment supplied by the employer shall be solely for the use by the employee in the performance of his duties. The employee is required to ensure that the equipment is available for use at a

place of work whenever required. It shall remain the property of the employer for a minimum of twelve (12) months.

- iv. It is agreed that any employee who losses or deliberately causes danger to such protective clothing or equipment shall be made to pay for the full cost of a new one to be provided by the employer.
- v. To promote safe working conditions and feeling of safety consciousness among the employees, a joint safety committee of representatives of the Branch Union and the Employer shall be established at each site. The committee shall meet as and when necessary to discuss such issues such as will promote safer working conditions.
- vi. The company in conjunction with the union shall prove instructions, train and supervise safety and preventive measures to avoid damages at work.
- vii. It is recognized that some companies have quarries, asphalt and cement batching plant as part of their operations. It is agreed that employees engage in their operations shall be covered by the following conditions.
- viii. Medical check-up during employment.
- ix. Final check-up before discharge at the discretion of the management
- x. In the case of employees' quarries, precast, sulphate and dusty areas, there shall be a medical check-up at least twice a year by the company`s doctor
- xi.** The employer shall supply two sets of uniform to all female employees

2.5 SAFETY POLICY

Under the terms of the Health and Safety at Work Act etc, 1974 every employer has a duty to prepare a written statement of general policy with regards to health and safety of their employees while they are at work.

Table 2.1: - Basic Safety Policy

<p>1.POLICY STATEMENT</p> <p>Policy statement to ensure the health, safety and welfare of employees at work together with people not in the firm's employment, so that they are not exposed to risk.</p>
<p>2.POLICY OPERATION</p> <p>This shows the responsibilities of employees belonging to the company and ensure that safety training and instructions are provided.</p>
<p>3.ORGANIZATION AND ARRANGEMENTS</p> <p>This section of the policy stipulates the responsibility for all matters concerning health and safety, including provision for specific types of works,</p>
<p>4.INFORMATION ARRANGEMENTS</p> <p>This category is made to monitor development in safety and show the type of information which must be collected. Eg accident reports.</p>

Sample Written Program for Construction Safety Policy.

2.6 SAFETY TRAINING

Training and education should go hand in hand or dependent on each other since is a most necessary and important attribute to any organization. Training without education and adherence cannot be effective. A suitable designed training scheme should be

designed to define the methods and procedures operations ought to be carried out and also specifying the regulations concerning the hazardous nature of the operation at hand. (Hale, 1984)

Operative training is the key to any organization`s effectiveness in the light of the organization`s safety and health programs, policies and plans geared towards the prevention of hazardous activities, injuries and illness. A well planned and designed training scheme most surely encourage all to regard safety in its proper light, which would reduce accidents and, in so doing, cut costs. (Davies and tomasin, 1990)

Training is a continuous practice, usually commences at the early stages of a young operative`s career and freshly employed personnel when it is important and easier to instill correct procedures and practices. It should seek to address general safety and health issues, as well as specific procedures for working safely without giving room for injuries and illness. (HSE 2003)

With most building firms now having a Safety Officer, or even if only a share of a group Safety Officer, general training is more organized. Also with the development of safety training centers and various safety courses regularly being put on through the Construction Industry Training Board and others, knowledge on safety is being spread throughout the industry. The use of short lectures, films, handouts, posters and possible safety bonus schemes are all useful aids that are available to the Safety Officer. ‘Whatever aid is used, it should be in conjunction with continuous education in safety and not just a ‘flash in the pan’ approach.

2.7 SOME SAFETY TRAINING TECHNIQUES

2.7.1 Lectures

Lectures are of short duration; say one hour once a month. This will prevent operatives getting bored or loaded down with too much information at one time. It is best if a specific safety topic is tackled each time. This short lecture could be held in firm's time without much loss of progress.

2.7.2 Films or slides

Films, videos and slides shows could be down in the lecture to create interest, but whenever these are used, a brief summary or question and answer period should follow to ensure points shown are fully understood by workers.

2.7.3 Handouts

Handouts and leaflets could be obtained for putting in operatives' wage packets, and useful to keep safety in his thoughts.

2.7.4 Safety bonus

A simple scheme can be designed so that a whole site can participate, for example: each operative receives a pound standing bonus, if a few minor accidents occur, but on the other hand, if serious accidents occur, the site loses complete bonus. This makes everyone aware of others shortcomings, and an eye kept out for danger, as no one likes his or her pocket being hit.

2.7.5 Short courses

All personnel should be allowed to go on short courses as long as they are of a standard they can understand and will find helpful in their daily work. Safety is the concern of all, individuals, company and nationally; it is therefore important that all safety precautions should be adhered to and maintained. (Butler 1978).

2.8 PERSONAL PROTECTIVE AND LIFE SAVING EQUIPMENT

2.8.1 Head Protection:

Willie Hammer (1981) insists that employees working in areas where there is danger of head injury from impact, flying or falling objects, electrical shocks and burns shall be protected by helmets which shall meet the specifications contained in ANSI Z89, 1-1996 and ANSI Z89, 2-1970, Safety Requirements for Industrial Head Protection. Protective hard hats become almost universal in its application of the construction job. The hard hat shall resist penetration by falling objects while the lacing holds the shell away from the skull and will cushion any heavy blow preventing the force from being transmitted directly to the skull.

2.8.2 Eye and Face Protection:

Eye and face protections are selected based on the anticipated hazards that will be associated with .According to OSHA, safety glasses or face shields are worn anytime work operation can cause foreign objects getting into the eye such as during welding, cutting, grinding, nailing or when working with concrete and or harmful chemicals or when exposed to frying particles. The requirement of ANSI Z87. 1-1968, Practice for Occupational and Education Eye and Face Protection, employees shall wear goggles and

face protection when the operation demands so, such as welding, cutting, sawing and chipping.

2.8.3 Work gloves:

Work gloves protect the construction worker’s hand from rough material being handled and to prevent blistering of the palm. Heavy gloves protect welders` hands from heat and radiation burns of electrical arc. Special rubber gloves also protect hands from hazardous chemicals and staining substance.

2.8.4 Hearing Protection:

When employees are subjected to sound levels exceeding some decibels, for a period, the sound would have to be reduced or personal protective equipment must be provided. The maximum shall not exceed 140dB peak sound levels. Other permissible exposures are illustrated on the table below. Ear protection devices which are inserted into ears or worn over the head should be provided when noise levels cannot be reduced:

Table 2.2 Illustrating sound level in decibel which the human ear can accommodate per day hours

Duration per day-hours	Sound level dBA slow response
8	90
6	92
4	95
3	97
2	100
1.5	102
1	105
0.5	110
0.25	115

The above table is a reprint from Safety Manual by The National Safety Council – Chicago, USA.

2.8.5 Safety Belts, Life lines and Lanyards:

A safety belt is used for employees safe guarding which must be secured above the point of operation to an anchorage or structural member capable of supporting a minimum dead load of 5400 lbs. For rock scaling operations, a minimum of 22mm wire core manila rope should be used and for other operations 19mm manila rope. For safety lanyards, a minimum of 12mm nylon or equivalent for maximum length to provide for falls no longer than 1.80mm with a breaking strength of 5400lbs or more. Provision of these equipments should be made for when working at heights greater than 7.50m above the ground or in deep shaft.

2.8.6 Safety nets:

Safety nets shall be provided when working in places more than 7500mm above the ground or water surface or wheel ladders, scaffolds, catch platform, temporary floors, safety lines or safety belts are not practicable. Nets shall extend 2400mm from the edge of the work surface and shall be of maximum mesh size 150mm x 150mm of 19mm diameter number grade pure manila, 6mm nylon or 10mm polypropylene rope. Actually the net does not protect the worker against falling from a high structure but it prevents the person 1mm falling to the surface below the net. (Forster, 1978).

2.9 NOTICES, REGISTERS AND NOTIFICATIONS

Safety posters alert people to safe practices. Signs indicating entrances and exits, danger notices, scaffold tags, fire notices and all other notices should be clearly displayed on site. Poster locations should be clearly selected and should be in prominent locations that will not interfere with traffic, yet provide high visibility. They should be centered at the eye level about 1.50m above the floor level in well lighted areas or even with their own light where possible such as washrooms, dry room, canteens and eating areas. Posters should not be cluttered at one place with other notices. (Forster, 1978).

2.10 SANITATION

2.10.1 Portable water

Portable drinking water must be available on site and water containers should be made of materials that do not affect the quality of the water. Use of common drinking cup is prohibited and containers must be cleaned regularly and refilled daily. Containers used for drinking water must not be used for any other purpose (Oregon, 2006).

2.10.2 Non-portable water

Non-portable water must be clearly indicated so that there no connection between non-potable and potable water systems. (Oregon, 2006)

2.10.3 Toilets

Table 2.3 illustrating toilets and urinals that must be provided for employees:

Number of employees	Number of toilets and urinals
Up to 20	1 toilet
Between 20 and 200	1 toilet and 1 urinal per 40 employees
200 and more	1 toilet and 1 urinal per 50 employees

Reprint from Oregon News Letter for Construction Industry

Sites with no sanitary sewers should have either chemical toilets, recirculation toilets or combustible toilets unless prohibited by local authorities.

Construction projects over \$1 million estimated cost should have flush toilets and washing facilities like wash basin. At sites where employees are exposed to hazardous materials, hand -washing facilities must be provided (Oregon, 2006).

2.10.4 ILLUMINATION

The lighting on site should be enough to illuminate properly. According to the construction inspection handbook by Barry 1999, the following areas should be lighted as follows:

Table 2.4 illustrating the number of lamps required in certain areas of construction.

Foot candles	Areas of operation
5	General construction site
3	Waste areas, access routes, loading platforms, store rooms
5	Indoors, warehouses, corridors, hail ways,
10	Tunnels, shafts, mucking and scaling
10	General construction plant and shops
3	First and station, Infirmarys and offices

Source: Barry 1999

2.10.5 HAND POWER TOOLS

Only site workers trained in handling power tools must be allowed to handle them. They must be maintained in a safe condition, and when designed to accommodate guards, must be equipped with them in use (all moving parts must be guarded) in accordance with ANSI 815. 1-1953. they must always be guarded with pressure switch which shuts down when pressure is released and electrical power operated tools be equipped in double insulation and plugs removed from socket when servicing and maintaining. All fuel-

powered tools must be stopped when refueling, servicing or being maintained. Grinding and abrasive wheels must be in accordance with the Safety Code for Use, Care and Protection, 1964 and appropriate eye protection must be worn when in use. Tools shall not be pointed at any one nor shall no pranks be played on fellow workers on site. The Construction Inspection Handbook insists on adequate time being given for machinery and equipment to be checked properly for faults before use.

2.11 MOTOR VEHICLES

A banks man should always be available to direct any motor vehicle on site especially when reversing. All motor vehicles on site should be provided with siren, emergency brakes, two headlights, two tail lights and brake lights and the vehicles should be chocked whenever parked. All controls should be in neutral position when not in use and equipment such as seat belts, rear view mirror, operating levers and safety latches shall all be in accordance with the Standard Vehicle Codes. (H.S.E, 1988)

New materials and techniques require safety considerations. Typical of these is the handling of pre-stressed members whose tendons should be prevented from being placed under very high tensions which when mishandled or released in this case can whiplash across a large area putting the workers in grave danger. (H.S.E, 1988)

It should be ensured that equipments do not perform below expected loads, as the Construction Inspection Handbook requires of cranes, pallet trucks, pump trucks and barrows. Overloading of these equipments should be strictly prevented. (H.S.E, 1988)

The employer for every employee must make provision of medical aid readily available. In the absence of clinics, hospitals or any infirmaries in proximity to the worksite,

properly trained and certified first aid personnel must be made. Appropriate supplies and equipment for transportation of injured personnel must be provided.

2.11.1 Mechanical Vibrations:

Mechanical vibration should be cut down as much as possible as they tend to change a condition known as the dead fingers or whole fingers. Repeated motion likewise should be minimized since it would cause much strain on a part of a body which leads to a condition known as Tenosynovitis.

2.11.2 HAZARDOUS CHEMICALS

Description of hazards should be clearly spelt out to employees when handling hazardous chemicals and poisons as well as procedures in handling and the appropriate safety equipment which can reduce the risk of undue exposure. Similar admonitions apply to potentially hazardous working conditions and situations such as the use of inflammable liquids, gases or toxic materials as clearly spelt out by (Foster, 1978).

2.11.3 Some important points to note when dealing with hazardous chemicals:

- Employees shall be given refreshes training on annual basis. Materials presented in the training shall be presented verbally to workers who have difficulty in reading written materials.
- Whenever possible, hazardous chemicals should be kept in thin artificial containers. Should an artificial container ever become defective, the chemical will be transferred to a similar type of container. The label should then be transferred

to the replacement container and be securely attached, if not transferable, a new label should be made. Signs and placards should be placed on all large containers in which hazardous chemicals are used. All chemicals on site are to be listed.

- Never use materials from an unlabeled container.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 INTRODUCTION

This chapter deals with the way in which the research was conducted and data presentation pertaining to the research topic: assessment of operatives' safety on building construction sites in the Accra Metropolis.

The research focused on building construction operatives in all classes, which was mainly conducted on building construction sites where major building activities were being executed.

3.2 RESEARCH APPROACH

There two main types of research approach; quantitative and qualitative. The nature of the research motivated the use of the quantitative approach. Campo, (2005) described quantitative research with measurement of variables and the delivery of results in digital form in which the results of the research are described by the interval text important relationships of trust and proven mathematically. Quantitative research was used to measure how people feel, think and act a certain way and is a research technique for quantifying the data and apply some statistical analysis attempts. It has often been formalized and structured and the data are usually obtained from large samples. It also includes the use of structured questionnaires typically include are open and closed ended questions.

3.3 RESEARCH POPULATION AND SAMPLING

The population of a research is the universe of units from which the sample is selected (Bryman, 2004). The population of this research covers building construction sites in Accra.

Sampling is a process of selecting a portion of population to represent the total population, and the findings from the sample represents the rest of the group .The selected sample should therefore, have similar characteristics to the population under the study to allow generalizability of the results to represent the population (Burns et al., 2001, Polite et al., 2006).

3.4 SAMPLING TECHNIQUE

The purposive or judgmental sampling technique which comes under non-probability sampling, was chosen for this research. This is because, the population and the purpose of study is known. Purposive sampling is very useful for scenarios where a targeted ample need to the attained quickly and where sampling for proportionality is not the main concern.

The selection criteria for the construction sites were that;

- There should be active construction activities on the site
- The construction firms undertaking activities on these sites should have a health and safety policy.

Therefore, project managers, laborer's, site supervisors, site engineers; safety officers who were with active construction sites that practice health and Safety policies were contacted. Building sites were selected using purposive sampling. The convenience

sampling was also used in selecting operatives working on the building construction sites in Accra Metropolis which came up to a total of 50

3.5. DATA COLLECTION

The data collection for the research was mainly based on two sources: Primary source data collection and Secondary source data collection

3.5.1. PRIMARY DATA COLLECTION

The primary source of data collection was from the field survey where distribution of questionnaires was used.

3.5.2 SECONDARY DATA COLLECTION

The secondary source of data collection was based on past survey on the same topic that has been conducted by other researchers from the following:

- Published and unpublished books
- Journals and articles
- Web pages
- Institutional bodies

3.6 QUESTIONNAIRES DEVELOPMENT

The development of the research questionnaires was in two folds: questionnaires design and distribution.

3.6.1 QUESTIONNAIRE DESIGN

The design of questionnaire for this research was based on the objectives of the survey which seek to set out the goals to attain in the study.

The questions asked were based on range of safety issues which could help to solicit adequate information from the targeted group. In all, there were twenty questions on a five paged A4 sheets with cover

3.6.2 QUESTIONNAIRE DISTRIBUTION

Fifty questionnaires were distributed to all categories of all building construction operatives who were purposively selected in the Accra metropolis to assist assess operative's safety on building construction sites.

Majority of the operatives were located on their project sites whilst a few of them were found in their offices. Out of the fifty questionnaires sent out, forty were returned and base on this was the research carried out analyzes to draw conclusions.

3.7 DATA ANALYSIS

Data analysis was done by determining the average response to each of the questions. Analysis of the study was carried out using descriptive statistical tool such as the tubular analysis where responses were spread in percentages.

CHAPTER FOUR

DISCUSSION AND ANALYSES

4.1 INTRODUCTION

This chapter presents the collected data, and analyses of the data to address the specific objectives in Chapter One of the study. The major areas the chapter discusses include respondent's background, the safety control measures of the building construction industry, the plans and policies of the industry in handling accidents and injuries, and the safety preventive measures instituted by the building construction firms. The result in this chapter of the study is presented through tabular analyses with the aid of frequencies and percentages of the responses of the surveyed respondents of the building construction industry.

4.2 SOCIO DEMOGRAPHIC CHARACTERISTICS OF RESPONDENTS

The researcher attempted to sample 50 operatives in the numerous construction sites in the Accra metropolis for the study, but received a response from 40 of the construction operatives. This therefore indicates that the study had a response rate of 80.0%. The demographic information of the surveyed respondents is discussed in this section of the study. The major socio demographic characteristics discussed were the position or rank of the respondents in the building construction company and working experience with the construction firm. The result of the demographic information of the surveyed respondents is presented by Table 4.1.

Table 4.1: Socio Demographic Information

Demographics	Frequency	Percent
Position in company		
Project manager	8	20.0
Site engineer	5	12.5
Clerk of works	3	7.5
Safety officer	18	45.0
Site supervisor	4	10.0
Labourer	2	5.0
Years spent with firm		
Less than a year	3	7.5
1-5 years	4	10.0
6-10 years	25	62.5
10+ years	8	20.0

Source: Field Survey, 2014

From Table 4.1 out of the total surveyed respondents of 40, the majority (45.0%) were safety officers of building construction firms in the Greater Accra Region, whereas 20.0% were project managers. Health and Safety at work Regulation 1999 management states that, employers should conduct risk assessments, make arrangements to implement necessary measures and arrange for needed information and training and hence the need for safety professionals like safety officers. However, 12.5% of the surveyed respondents of the sampled building construction firms were site managers whereas 10.0% were also site supervisors. The majority (62.5%) of the surveyed respondents of the sampled

building construction firms have between 6 to 10 years of working experience with their respective building construction firms in the Accra metropolism`20lis. However, 10.0% of the surveyed respondents have 1 to 5 years of working experience with their respective building construction firms whereas 20.0% have more than 10 years of working experience.

4.3 COMPANY'S SAFETY CONTROL MEASURES

The safety control measures of the surveyed building construction sites in the Accra metropolis are discussed in this section of the study. The section discusses issues such as the presence of safety policies, means of publicizing the safety policies, level of adherence to the safety policies, and rate at which the companies keep records of accidents and injuries. The result of the section is presented in Table 4.2. through frequencies and percentages.

Table 4.2.: Safety Control Measures of the Company

	Frequency	Percent
Company have health and safety officer		
Yes	31	77.5
No	9	22.5
Years company has been using health and safety policy		
Less than a year	2	5.0
1-5 years	7	17.5
6-10 years	21	52.5
10+ years	10	25.0
Means of publicizing health and safety policy		
Posters	23	57.5
Film shows	3	7.5
Handouts	4	10.0
Seminars	1	2.5
Slogans	9	22.5
Level of company's health and safety policy		
Very strict	21	52.5
Moderately strict	9	22.5
Highly strict	6	15.0
Not strict	4	10.0
Rate company hold health and safety meetings		
Weekly	3	7.5

Monthly	27	67.5
Quarter-yearly	8	20.0
Semi-yearly	2	5.0
Annually	0	0.0
Rate company keep records of accident and/or injuries		
Often	32	80.0
Not often	5	12.5
More often	3	7.5
Not at all	0	0.0
Treatment of the handling of loads on site		
Manually	6	15.0
Mechanically	34	85.0

Source: Field Survey, 2014

From Table 4.2. out of the total surveyed respondents of 40, the majority (77.5%) were of the opinion that their respective companies have safety officers, whereas 22.5% believed otherwise. According to Timbermat Ltd, (2011), safety assessment should be carried out before the beginning of any work to ensure the safety of all construction works and visitors and hence the need for safety officers. Furthermore, to develop a reliable safe system an initial site safety survey must be conducted by a competent personnel before the work on the lift/escalator begins. The personnel to conduct this survey should be a safety expert or an experienced engineer with sufficient knowledge on safety and health at lift and escalator works. After the survey is conducted, safety and health issues should

be identified and recorded (The Real Estate Developers Association of Hong Kong et al, 2005).

The majority (52.5%) of the surveyed respondents of the study believe that their respective building construction companies have been using safety policies for 6 to 10 years, whereas 25.0% believe their companies have been using safety policies for more than 10 years. Under the terms of the Health and Safety at Work Act etc, 1974 every employer has a duty to prepare a written statement of general policy with regards to health and safety of their employees while they are at work (HSE leaflet 2003). Some major identified personal protective kits and equipment that most of the surveyed construction companies normally provides for operatives include head gear, equipment for eye and ear protection, work gloves, Safety Belts, dust mask, booths, protective clothing, safety appliances, fire-fighting equipment and many others. The provision of these protective kits and equipment are in adherence or compliance to the Labour Act, 2003 (ACT 651), Workmen's Compensation Act and the Factories, Offices and Shops Act, 1970. Furthermore, some of the major sanitary facilities the surveyed construction companies in the Greater Accra Region provide on construction sites include toilet and washing facilities, safe drinking water, and rest room. The provision of these facilities are also in adherence to the Labour Act, 2003 (ACT 651), Workmen's Compensation Act and the Factories, Offices and Shops Act, 1970.

The majority (57.5%) of the surveyed respondents were of the opinion that their respective building construction companies predominantly publicize safety policies through posters, whereas 22.5% also believed safety policies are publicized through

slogans of the companies. The majority (52.5%) of the surveyed respondents of the sampled building construction companies believed that the safety policies of the surveyed building construction companies in the Accra metropolis were very strict, whereas 22.5% believed they were just moderately strict. The majority (67.5%) of the surveyed respondents were of the opinion that their respective building construction firms in the Accra metropolis hold safety control meetings monthly. The surveyed building construction companies in the Accra metropolis often keep records of accidents and/or injuries as indicated by 80.0% of the surveyed respondents of the study. The loads on sites are believed by the majority (85.0%) of the surveyed building construction companies to be handled mechanically.

4.4 COMPANY'S PLANS AND POLICIES FOR HANDLING ACCIDENTS AND INJURIES

This section of the study discusses the plans and policies instituted in the surveyed building construction companies to handle accidents and injuries on site. To achieve this objective, the section touched on issues including company's plans in cases of accidents and injuries, and the means of treating hazards on site. The result of the section is presented in Table 4.3 with the aid of frequencies and percentages.

Table 4.3: Plans and Policies to Handle Accidents and Injuries

	Frequency	Percent
company`s plans, in cases of accidents and emergencies		
First Aid Assistance on site	32	80.0
Rush out to clinics	8	20.0
Person company reports issues of accidents and injuries		
Local authority	0	0.0
Opinion leaders	0	0.0
Police station	3	7.5
Labour office	35	87.5
Not at all	2	5.0
Means company treats hazard on site		
Secure it using the basic steps	12	30.0
Leave it for the authorities to take care	4	10.0
Report to authorities on site	24	60.0
Rate of housekeeping practice on site		
Every week	27	67.5
Once every month	3	7.5
Twice every month	10	25.0

Source: Field Survey, 2014

From Table 4.3. out of the total surveyed respondents of 40 of building construction firms in the Accra metropolis, the majority (80.0%) indicated that first aid assistance on site is their company's plans in cases of accidents and emergencies. Existing literature also

emphasizes basic health and safety requirements and recommends that the basic health and safety tools should be available like the first aid box and employees should be trained on how to use it (Timbermat Ltd, 2011). The need for first aid assistance on site is also consistent with Management of Health and Safety at Work Regulation 1999, which stipulates the Health and Safety (First Aid) Regulations 1981 as requirements for companies. Based on the Labour Act, 2003 (Act 651), it is the obligation of every worker to use the safety appliances, fire-fighting equipment and personal protective equipment provided by the employer in compliance with the employer's instructions.

The majority (87.5%) of the surveyed respondents indicated that their respective surveyed company's reports issues of accidents and injuries to the labour office, whereas 7.5% believe it is reported to nearby police stations. The majority (60.0%) of the surveyed respondents of the building construction companies were of the opinion that hazards on sites are reported to authorities on site, whereas 30.0% believe hazards on sites are secured using basic steps. Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 1995 (RIDD): require employers to notify certain occupational injuries, diseases and dangerous events. The Labour Act, 2003 (ACT 651) requires companies to report occupational accidents and diseases (Section 120). The General Health and Safety Conditions spelt out in the Labour Act, 2003 (ACT 651) (Section 118) indicates that it is the duty of an employer to ensure that every worker employed by him or her works under satisfactory, safe and healthy conditions. The Act further stipulates that the employer should ensure that the workplace is safe for employees to work. The employer must all take measures to prevent contaminations of

workplace and protect employees from toxic substances. Housekeeping is often practiced on site every week as suggested by the majority (67.5%) of the surveyed respondents of the study.

4.5 COMPANY'S PREVENTIVE MEASURES AGAINST ACCIDENTS AND INJURIES

This section of the study discusses the instituted preventive measures against accidents and injuries of the various building construction companies in the Accra metropolis. To achieve this objective, the section touched on major issues including punitive measures in place for operatives that flout safety policies, available incentives for compliers of safety policies and the awareness of respondents of health and safety regulations in Ghana. The result of the section is presented in Table 4.4 with the aid frequencies and percentages.

Table 4.4 Accident and Injury Preventive Measures of the Company

	Frequency	Percent
Measures in place for operatives that flout health and safety policies		
Fine	23	57.5
Dismissal	11	27.5
Forfeiture of salaries	3	7.5
Suspension	3	7.5
Measures in place for operative that comply with safety policies		
Promotion	27	67.5
Salary increase	13	32.5
Manner company compensate operatives injured in accidents in line of discharging duty		
Base on the nature of injury	2	5.0
Base on the cause of injury	7	17.5
Base on Workmen's Compensation Act	23	57.5
Base on the job undertaking	3	7.5
Base on the output of operative	5	12.5
Rate company allows operatives to go for medical checkup		
Every six months	9	22.5
Every year	26	65.0
Every two years	5	12.5
Health and safety regulation known		
Labour Act 2003	3	7.5
Workmen's Compensation Act	2	5.0
Factories, Office and Shops Act 1970	0	0.0
All of the them	35	87.5

Source: Field Survey, 2014

From Table 4.4, out of the total surveyed respondents of 40, the majority (57.5%) indicated that the operatives of the sampled building construction firms that flout safety policies and plans of the companies are often fined for a specified period of time, whereas 27.5% believe they are dismissed. Any form of dismissal by employers under circumstances in which employees remove themselves from dangers or hazards is in contravention to the Section 119 of the Labour Act, 2003. However, the majority (67.5%) of the surveyed respondents indicated that operatives of the sampled building construction companies that comply with the safety plans and policies of the company are often promoted, whereas 32.5% believe they are encouraged through salary increment. The majority (57.5%) of the surveyed respondents of the study indicated that the companies compensate operatives injured or involved in accidents in the line of discharging duties based on the Workmen's Compensation Act, 1987 PNDCL 187; whereas 17.5% indicated that such compensation packages are based on the cause of the injury. The Workmen's Compensation Act (law), 1987(PNDCL 187) compels all employers to make reports of all accidents to the nearest Labour Department. The operatives of the surveyed companies are allowed to go for medical checkups every year as indicated by the majority (65.0%) of the surveyed respondents of the study. The Factories, Offices and Shops Act, 1970 requires all workers to conduct medical check-up during employment and final check-up before discharge at the discretion of the management. In the case of employees quarries, precast, sulphate and dusty areas, there shall be a medical check-up at least twice a year by the company's doctor. The majority (87.5%) of the surveyed respondents indicated that their awareness and knowledge of

health safety regulations including Labour Act 2003 (ACT 651), Workmen`s Compensation Act, 1987 PNDCL 187, and the Factories, Office and Shops Act 1970.

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATION

5.1 INTRODUCTION

This chapter mainly focused on key finding of the research problem analysis, how to improve the sector and conclusion of the study. The recommendations constitute principally managerial level policies.

5.2 SUMMARY OF FINDING

This research was set to meet the objectives of the study including: 1) To identify the measures in place to ensure health and safety regulations are adhered to by operatives, and 2) To identify health and safety regulations adhered to by operatives. Rigorous field works was conducted and below are the main findings:

5.2.1 To identify the measures in place to ensure health and regulations are adhered to by operatives.

Health and Safety control measures

The greater percentage of the surveyed respondents from the Greater Accra Region were found to have been working with construction companies that have health and safety policies as well as officers who ensures the appropriate institution of the health and safety plans and policies of the construction firms. The construction firms have had health and safety plans and policies for 6 to 10 years. The health and safety policies and plans of the companies are publicized predominantly through posters and slogans. The Health and safety policies and plans of the construction firms are deemed very strict. The surveyed

construction companies predominantly hold meetings on safety control measures monthly.

The companies often keep records of accidents and injuries.

Preventive measures against accident and Injuries

For most of the surveyed construction Sites, operatives that flout health and safety policies are fined or dismissed. However, operatives that comply with the health and safety policies and plans are promoted. First aid assistance on site is often employed in cases of accidents and emergencies on site. The construction companies were found to treat hazards on site by reporting to authorities on site. The construction firms practice housekeeping on site weekly.

5.2.2 To identify health and safety regulations adherence to by operatives'

The accidents in the construction companies are often reported to the labor office.

The operatives injured in accidents in line of discharging duty are compensated based on the Workmen's Compensation Act, 2003. Operative are often allowed by the construction firms to go for medical checkups annually. Operatives were working under safe, satisfactory and healthy conditions. Operatives were using personal protective equipment's provides to them on site as well as take good care of them. The common health and safety regulations known and adhered to by most of the operatives in the construction sites were the Labour law Act 2003, Workmen's Compensation Act, and the Factories, Office and Shops Act 1970 which are strictly enforced by their various companies.

5.3 CONCLUSION

From the study, it can be concluded that most of the construction sites on which the surveyed operatives were working are construction firms that have in place several health and safety measures to enhance the adherence to by operatives. Some of the major safety control measures of the construction companies found were having health and safety officers, instituting safety policies, publicizing safety control policies through posters and slogans, holding safety control meetings monthly, keeping records of injuries and handling loads on site mechanically. The construction sites have first aid assistance on site that handles cases of accidents and emergencies, and the companies often treat hazards on site by employing basic safety steps. Moreover, flouters of safety policies are fined or dismissed, whereas operatives that comply with the safety policies are motivated through promotion. Operatives of the construction sites are mandated to undergo medical checkups every year.

5.4 RECOMMENDATION

Based on the findings of the study, the study recommends several or numerous measures or policies that can be put in place to enhance the health and safety adherence of operatives in the construction sites in Ghana:

- Management should support by providing safety devise and allocating budgets to ensure structures are in good conditions to maintain good health and safety conditions.
- There should be proper supervision to ensure that employees adhere to safety measures so as to prevent accidents

- Employees should be rewarded for adhering to health and safety regulations so as to motivate others to follow suit.
- Training must be given to all employees on safety measures especially those how operate high risk plants so as to minimize the occurrence of accidents. Plants and equipment should be reviewed and monitored and ensure that operators are highly competent.

5.5 FURTHER RESEARCH

There are numerous research avenues in the future as a result of this study. An open avenue for future research can be directed to the study of the relationships between the occurrences of unsafe acts and site safety performance (eg. Accident rates)

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APPENDIX (I)

(QUESTIONNAIRE)

Assessment of operatives safety on Building Construction sites in Ghana

(A case study in Accra Metropolis)

The importance of this questionnaire is to solicit information to assess the extent to which construction building sites operatives are protected, and in effect to reduce the accidents frequency.

Any information provided will be treated with utmost confidentiality.

1. What is your position in this firm?
 - a) Project Manager b) Site Engineer c) Clerk of Works
 - d) Health and Safety Officer e) Site Supervisor f) Laborer
 - g) Others (State).....

2. How many years have you been with this firm?
 - a) Less than a year b) 1 – 5 years c) 5 – 10 years
 - d) More than 10 years

3. Does the company have a health and safety officer?
 - a) Yes b) No

4. How long has the company been using health and safety policy?
 - a) Less than a year b) 1 – 5 years c) 5 – 10 years
 - d) More than 10 years

5. By what means does the company publicize its health and safety policy?

- a) Posters
- b) Film Shows
- c) Handouts
- d) Seminars
- e) Slogans
- f) Other, (State).....

6. How do you see the level of the company`s health and safety policy?

- a) Very strict
- b) Moderately strict
- c) Highly strict
- e) Not strict

7. How often does the company hold safety meetings?

- a) Weekly
- b) Monthly
- c) Quarter- yearly
- d) Semi-yearly
- e) Annually
- f) Other (State).....

8. Does the company keep records of accidents and or injuries?

- a) Often
- b) Not often
- c) More often
- d) Not at all

9. How does handling of loads treated on site?

- a) Manually
 - b) Mechanically
 - c) Other
- specify.....

10. List some of the personal protective kits and equipment the company normally provides for its operatives

.....

11. List some of the Sanitary facilities the company has on site

.....

.....

12. What are the company`s plans, in cases of accidents and emergencies?
- a) First Aid Assistance on site
 - b) Rush out to clinics
 - c) Others (State).....
13. To whom do your company reports issues of accidents and injuries?
- a) Local Authority b) Opinion Leaders c) Police Station d) Labour Office
 - e) Not at all
 - d) Others (State).....
14. How does the company treats “hazard” on site?
- a) Report to the authorities on site b) Leave it for the authorities to take care
 - c) Secure it using the basic steps. d) others.....
15. How often is Housekeeping practiced on site?
- a) Every week b) once every month c) Twice every month
 - d) Others.....
16. What measures are in place for operatives who flout the health and safety policies and plans of the company?
- a) Suspension b) Dismissal c) Forfeiture of salaries/wages
 - e) Fines f) Others (State).....
17. What measures are in place for operatives who comply and obey safety policies and plans?
- a) Promotion b) Salary/Wage Increase
 - b) Others (State).....

18. In what form and manner do the company compensate operative when he or she is injured or involved in an accident in line of discharging his or her duty?

- a) Base on the nature of injury
- b) Base on the cause of injury
- c) Base on Workmen`s Compensation Act, 1987 PNDCL 187
- d) Others (State).....
- e) Base on the job undertaking
- f) Base on the output of operative

19. How often does the company allow its operatives to go for medical checkup?

- a) Every Six months
- b) Every Year
- c) Every Two years
- d) Others (State).....

20. Which of the following health and safety regulation do you know?

- a) Labour Act 2003 (ACT 651)
- b) Workmen`s Compensation Act, 1987 PNDCL 187
- c) Factories, Office and Shops Act 1970.

II

ASPECTS OF HEALTH AND SAFETY LEGISLATION

The following apply across the full range of workplaces:

- 1) Workplace (Health, Safety and Welfare) regulation 1992: cover a wide range of basic health, safety and welfare issues.
- 2) Health and Safety (Display Screen Equipment) Regulations 1992: set out requirements for work with Visual Display Units (VDUs).
- 3) Personal Protective Equipment at Work Regulations 1992: require employers to provide appropriate protective clothing and equipment for their employees.
- 4) Provision and Use of Work Equipment Regulations 1998: require that equipment provided for use at work, including machinery, is safe.
- 5) Manual Handling Operations Regulations 1992: cover the moving of objects by hand or bodily force.
- 6) Health and Safety (First Aid) Regulations 1981: cover requirements for first aid.
- 7) The Health and Safety Information for Employees Regulations 1989: require employers to display a poster telling employees what they need to know about health and safety.
- 8) Employers` Liability (Compulsory Insurance) Act 1969: require employers to take out insurance against accidents and ill health to their employees
- 9) Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 1995 (RIDD0): require employers to notify certain occupational injuries, diseases and dangerous events.
- 10) Noise at Work Regulations 1989: require employers to take action to protect employees from hearing damage.

- 11) Electricity at Work Regulations 1989: require people in control of electrical systems to ensure they are safe to use and maintained in a safe condition.
- 12) Control of Substances Hazardous to Health Regulations 2002(COSHH): require employers to assess the risks from hazardous substances and take appropriate precautions.

GENERAL HEALTH AND SAFETY CONDITIONS (SECTION 118)

- 1) It is the duty of an employer to ensure that every worker employed by him or her works under satisfactory, safe and healthy conditions
- 2) Without limiting the scope of subsection (1), an employer shall
 - a) Provide and maintain at workplace, plant and system of work that are safe and without risk to health;
 - b) Ensure the safety and absence of risk to health in connection with use, handling, storage and transport of articles and substances;
 - c) Provide the necessary information, instruction, training and supervision having regard to the age, literacy level and other circumstances of worker to ensure, so far as is reasonably practicable, the health and safety at work of those other workers engaged on the particular work;
 - d) Take steps to prevent contamination of workplaces by , and protect the workers from, toxic gases, noxious substances, vapours, dust, fumes, mists and other substances or materials likely to cause risk to safety or health;

- e) Supply and maintain at no cost to the worker adequate safety appliances, suitable fire-fighting equipment, personal protective equipment, and instruct the workers in the use of the appliances or equipment;
 - f) Provide separate, sufficient and suitable toilet and washing facilities and adequate facilities for the storage, changing, drying and cleansing from contamination of clothing for male and female workers;
 - g) Provide adequate supply of clean drinking water at the workplace; and
 - h) Prevent accidents and injury to health arising out of, concerned with, or occurring in the course of, work by minimizing the causes of hazards inherent in the working environment.
- 3) It is the obligation of every worker to use the safety appliances, fire-fighting equipment and personal protective equipment provided by the employer in compliance with the employer's instructions.
- 4) An employer shall not be liable for injury suffered by a worker who contravenes subsection (3) where the injury is caused solely by non-compliance by the worker.
- 5) An employer who, without reasonable excuse, fails to discharge any of the obligations under subsection (1) or (2) commits an offence and is liable on summary conviction to a fine not exceeding 1000 penalty units or to imprisonment for a term not exceeding 3 years or to both.

EXPOSURE TO IMMINENT HAZARDS (SECTION 119)

- 1) When a worker finds himself or herself in any situation at the workplace which she or her has reasonable cause to believe presents an imminent and serious

danger to his or her life, safety or health, the worker shall immediately report this fact to his or her immediate supervisor and remove himself or herself from the situation.

- 2) An employer shall not dismiss or terminate the employment of a worker or withhold any remuneration of a worker who has removed himself or herself from a work situation which the worker has reason to believe presents imminent and serious danger to his or her life, safety or health.
- 3) An employer shall not require a worker to return to work in circumstances where there is a continuing imminent and serious danger to the life, safety or health of the worker.

EMPLOYER TO REPORT OCCUPATIONAL ACCIDENTS AND DISEASES

(SECTION 120)

An employer must report any occupational accidents and diseases which occur in the workplace not later than 7 days.

SPECIFIC MEASURES (SECTION 121)

The Construction and Building workers in Ghana also had a union which was formed in 1941 under the name “Crafts Union of Ghana”. This name was later changed to the Construction and Building Workers Union of Ghana (CBMWA) under the Trade Union Congress (TUC) in 1965.

The main aim of this union is to make sure that its members are treated fairly and are also working under safe conditions on site. They also operate on the following legal regulations:

- a. Workmen's Compensation Act (law), 1987(PNDCL 187)
- b. Factories, Offices and Shops Act, 1970