

JIMMA UNIVERSITY
JIMMA INSTITUTE OF TECHNOLOGY
SCHOOL OF GRADUATE STUDIES
FACULTY OF CIVIL AND ENVIRONMENTAL ENGINEERING
CONSTRUCTION ENGINEERING AND MANAGEMENT CHAIR

ASSESSMENT OF CONTRACTUAL AND LEGAL OCCUPATIONAL
HEALTH & SAFETY REGULATIONS COMPLIANCE ON PUBLIC
BUILDING CONSTRUCTION PROJECTS IN ADDIS ABABA

A Thesis Submitted to the School of Graduate Studies of Jimma University Institute of
Technology, Faculty of Civil and Environmental Engineering in partial fulfillment of the
requirement for the degree of Master of Science in Construction Engineering and
Management.

By: Fitsum Tadesse

January 2020

Jimma, Ethiopia

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DECLARATION

I declared that this research entitled ‘’ Assessment of Contractual and Legal Occupational Health & Safety Regulations Compliance on Public Building Construction Project in Addis Ababa’’ is my own original work, and has not been submitted as a requirement for the award of any degree in any our university or elsewhere.

	Signature	Date
Fitsum Tadesse	_____	_____

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ABSTRACT

Construction industry is high-risky industry to the safety of employees. For that matter health and safety regulations are introduced to safeguard employees' health and safety and to minimize risks and dangers as much as reasonably practicable. Having regulation is not enough to safeguard health and safety of employees unless if employer and employees complied with it because most accidents happened in construction sites is caused by lack of taking proper safety measures. Federal public procurement agency contract (PPA-2011) and Ethiopia labour proclamation 377/03 set minimum health and safety requirements. There is high fatality and accident rate in sub-Saharan African countries and particularly in Addis Ababa 20 construction related death accidents were reported to AABOLSA within less than 3 months in 2019/2020. Hence, the objective of this study was to assess contractual and legal occupational health and safety regulations compliance on public building construction projects in Addis Ababa.

The study purposively took total fourteen (14) public building construction projects constructed by grade one local contractor as a sample. The study applied descriptive research method and the data for the study were collected using structured questionnaires, interviews and observation. The data analyzed using Microsoft excel in the form of Percent, averages and RII and the presentation of data is done in the tabular form

Accordingly, the study revealed that nearly most (91%) contractor's personnel have positive awareness on benefits of complying with health and safety regulation and also 85% respondents know that contractors have an obligation of complying with health and safety regulations. Around 50% of investigated sites comply half of the health and safety regulation requirements adopted for the study. The study results also reveal that lack of commitment of contractor's management, lack of strict enforcement of regulation by authority and less severe penalty for noncompliance or violations of regulations are factors that affect contractors to compliance with Health & Safety regulations in case of Addis Ababa public building construction projects.

To increase health and safety regulation compliance level the study recommends that contractors' management should show commitment to health and safety, regulatory agency should have to inspect construction site safety and enforce the regulation requirements, and also study recommends that there should be national standards to audit health and safety compliance of building construction site.

Keywords: *Health and safety, health and safety regulations, health and safety compliance*

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LIST OF ACRONYMS

AABOLSA	Addis Ababa bureau of labour and social affair
BC	Building contractor
ETB	Ethiopian Birr
GC	General Contractor
H&S	Health and Safety
HSE	Health and Safety Executive
ILO	International Labour Organization
MBSA	Master Builder of South Africa
MOLSA	Ministry Of Labour and Social Affair
OSHA	Occupational Safety and Health Administration
OH&S	Occupational Health and Safety
PPA	Public Procurement Agency
PPE	Personal Protective Equipment
UK	United Kingdo

CHAPTER ONE

INTRODUCTION

1.1 Background of Study

Occupational Safety and Health is area of discipline concerned with protecting the safety, health and welfare of people engaged in work or employment. Occupational Safety and Health is relevant to all branches of industry, business and commerce; particularly important for the construction industry because of construction sites are one of the most dangerous workplace with high incidence of accidents (Hughes & Ferrett , 2005).

Some standard contract includes or set conditions or requirements should be fulfilled from each contracting parties in order to safeguarding employee's safety and life. For instances in general condition of contract PPA/2011 on clause 45, the requirements and necessary steps shall be taken by contractor for the health and safety(H&S) of employees are specified. According to Subramani & Lordsonmillar (2014) once document signed by contractor and owner; wherein the contractor is obligated to make Provisions for the safety of men and structure and the consequences for failure to do so. The contractor is already mandated by law to comply with conditions of contract and national regulations.

Employer has legal duty to provide a safe place of work for his employees and he is legally liable for accident encounter by his or her employees in course of his employment. According to civil code of Ethiopia(1960) article 2548 the employer shall take measures required to safeguard the life, physical integrity, health and moral standing of employee and article 2549 state that 'employer is liable for accidents which the employee suffer arising from his work'. On labour proclamation 377/2003 on article 92 preventive measure taken by employer and his obligation are provisioned in order to make safe and healthy working environment for employees. Ethiopian Building Proclamation 624/2009 sets various requirement and procedures required to be taken by contractor, building owner and designer to health and safety of property and general public.

Contractor/employer shall have obligation to comply with H&S requirement as per law & contract agreement. Committing for safety is more than compliance of regulations. According to Beakon (2018) safety programme pay of themselves in the form of: lower accident rates,

less workmen's compensation claims, fewer stoppages and interruption, good safety record and reputation, increased worker confidence and output, lowered insurance premium, minimized negative publicity, improved relations with stakeholders, community, customers and investors, lower threat of legal action, lower employee absence and turnover rates, reduced costs related to accidents, recovery, risks and litigation and most importantly; increased productivity, because employees are healthier, happier and better motivated.

Generally, the aim of this study is to assess contractual and legal occupational health and safety regulations compliance level and also to identify factors that affect compliance with health and safety regulations and recommended safety practice in public building construction in Addis Ababa.

1.2 Statement of Problem

Construction is often classified as a high-risky industry as it has historically been plagued with much higher and unacceptable injury rates compared to other industries. Construction work involves a serious of occupational risks, such as work at heights (use of scaffolding, gangways and ladders), excavation work (use of explosives, earth moving machines), lifting of materials (use of cranes, hoists), and so on, which are specific to the sector (Adane, *et al.*, 2013).

In industrialized countries, more than 25% to 40% of work-related deaths occur on construction sites despite the sector only employing between 6% up to 10% of total employment (Smallwood, *et al.*, 2009). In United State construction workers accounted for a fatality rate of 9.1 per 100,000 full-time equivalent (FTE) workers, as opposed to the all-worker fatality rate of 3.5 per 100,000 FTE workers (Albert, *et al.*, 2014). According to Smallwood, *et al.*, (2009) the fatality rates and the accident rates in Sub-Saharan Africa is (21 and 16,012) per 100,000 workers respectively.

In context of Addis Ababa, within less than 3 months 20 construction work related death accident was reported from policy to Addis Ababa bureau of labour and social affair (AABOLSA, 2019). This number of death is only includes the number of deaths reported to police office and number of death is expected more than mentioned on above because it is expected that there is some death accidents might not be reported to police or concerned body

in various reason. According to AABOLSA most investigation results indicate that contractor is responsible for most of death accidents and injuries in terms of fail in taking proper safety precaution measures on workplace.

Contractual and legal occupational health and safety (OH&S) regulations are issued to promote health and safety of worker and for prevention and reduction number of occupational accidents and diseases. Therefore study on contractual and legal OH&S regulations implementation is crucial for effective enforcement of regulations. For that matter, it is important to find out the extent of contractual and legal OH&S regulations application on building construction sites. Specifically, the purpose of this study is to assess occupational health and safety regulations compliance level based on OH&S requirements on PPA/2011 general condition of contract and labour proclamation 377/2003; in particular compliance of first aid service, employees insurance, safety training, appointment of safety officer, establishment of safety committee, provisions of personal protective equipment and recording and reporting of employment accident and also to identify factors affecting compliance with occupational health and safety regulations on public building construction projects in Addis Ababa.

1.3 Research Question

- How much contractor's site personnel aware about the obligations of contractor to contractual and legal occupational health and safety regulation requirements and its H&S benefits?
- What is contractual and legal occupational health and safety regulations compliance level on public building construction projects in Addis Ababa?
- What are the factors that affecting compliance with occupational health and safety regulations on public building construction projects in Addis Ababa?

1.4. Objective

1.4.1 General Objective

The general objective of this study is to assess practice of contractual and legal occupational health and safety requirements in public building construction project in Addis Ababa.

1.4.2 Specific Objectives

The specific objectives of this study are:

- To determine the awareness of contractor's site personnel on obligation of contractor towards contractual and legal health and safety regulation requirements and its health and safety benefits.
- To evaluate contractual and legal occupational health and safety regulations compliance level.
- To identify factors that affecting compliance with occupational health and safety regulations in public building construction projects.

1.5 Significance of Study

Compliance with OH&S regulations benefits all stakeholders in construction and employees in number of ways such as minimize the risk of injuries or death at work, reduce costs for medical treatment for injuries, for employer avoid or minimize the costs such legal fees, fines, compensation damages, investigation time, lost production, lost goodwill from the workforce. This study is important to know OH&S regulation compliance level on public building construction sites and this is significant especially to regulatory bodies because it gives clue to them how much OH&S regulations are implemented. This helps to enforce the regulations especially on noncompliant and low compliant construction sites to OH&S regulations. In addition, the study is important to identify key factors that affect compliance with OH&S legislation by contractors. This is important to where and on what concerned body will work in order to increase the level of OH&S regulation compliance for the future.

1.6 Scope of the study

The study is limited to public building construction projects in Addis Ababa constructed by grade one (1) general contractor (GC) and building contractors (BC) local contractor. The study only focused on site safety practice on first aid service, employees insurance, safety training, appointment of safety officer, establishment of safety committee, provisions of personal protective equipment and recording and reporting of employment accident and also on factors affecting compliance with occupational health and safety regulations.

1.7 limitations of the study

The study adopt and used the specific requirements from ILO conventions & code of practice for construction, OSHA, HSE guides, MBSA, and related literatures for evaluating H&S compliance level as a criteria due to absence of specific requirements on proclamation and conditions of contract and so that this may limit to generalize study finding as representative of compliance level of construction sites on OH&S regulation of general conditions of contract and proclamation (specifically for the results of some few sub-specific requirements).

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

Health and safety is very important to all areas in the building and construction industry. It has always been considered very important as it is considered to be a greatly exposed sector when it comes to occupational accidents. In most countries – the reality is that the construction industry continually has injury and fatality statistics that make it one of the most dangerous industries in which to work predominantly (Cooney , 2016).

According to Lopez (2001) globally it is estimated that 55,000 fatal accidents occur at construction sites per year or stated otherwise, that one fatal accident occurs every ten minutes. The scale of construction safety problem is bigger in developing countries compared to developed countries.

2.2 Definition of Health and Safety

Before detailed discussion issue of construction health and safety it is important to define some basic occupational health and safety definitions are required. According to Phil & Edward (2005):

Health: - the protection of the bodies and minds of people from illness resulting from the material, processes or procedures used in workplace.

Safety - the protection of people from physical injury. The borderline between health and safety is ill-defined and the two words are normally used together to indicate concern for the physical and mental well-being of the individual at the place of work.

Welfare - the provision of facilities to maintain the health and well-being of individuals at the workplace. Welfare facilities include washing and sanitation arrangements, the provision of drinking water, heating, lighting, and accommodation for clothing, seating (when required by the work activity), eating and rest rooms. First aid arrangements are also considered as welfare facilities.

Occupational or work-related ill-health- is concerned with those illnesses or physical and mental disorders that are either caused or triggered by workplace activities. Such conditions

may be induced by the particular work activity of the individual or by activities of others in the workplace.

Accident - defined by the Health and Safety Executive as ‘any unplanned event that results in injury or ill health of people, or damage or loss to property, plant, materials or the environment or a loss of a business opportunity’.

Hazard and risk - a hazard is the potential of a substance, activity or process to cause harm. Hazards take many forms including, for example, chemicals, electricity and working from a ladder.

2.3 Importance of Occupational Health and Safety

The human, social and economic costs of occupational accidents, injuries and diseases and major industrial disasters have long been cause for concern at all levels from the individual workplace to the national and international (Alli, 2008). According to European Agency for Safety and health and safety work (2007); Occupational safety and health (OS&H) is good for business as well as being a legal and social obligation. OS&H taken as essential part of good business and investing on OH&S have the benefits like helps demonstrate that a business is socially responsible, protects and enhances brand image and brand value, helps maximize the productivity of workers, enhances employees’ commitment to the business, builds a more competent & healthier workforce, reduces business costs and disruption, enables enterprises to meet customers’ OSH expectations, and encourages the workforce to stay longer in active life.

According to Ruttenberg (2013) the damage on employees, property, equipment, and morale can have a detrimental effect construction company’s profit and loss statement. So that accidents are too costly and that accident prevention makes sense economically. Every accident or illness prevented saves companies tens, if not hundreds, of thousands of dollars. Prevention of an incident means that company sales can go to other expenses and profit rather than paying medical bills and related expenses.

2.4 Common Accidents in Building Construction Projects

In any country, construction site are one of the most dangerous place to work. No matter how many laws and safety procedures are in place, in construction site injuries and death are

unfortunately quite common (Collins, 2013). According to HSE (2006) the most frequent accidents and ill health in construction sites are:

I. Accidents

Falls: People fall because access to and from the workplace is not adequate, or the workplace itself is not safe. The importance of providing good access to a safe working position (eg a platform with toe boards and guard rails) cannot be over-emphasized.

Mobile plant: Construction plant can be heavy. It often operates on ground which is muddy and uneven, and where driver visibility is poor. People walking on site are injured or killed by moving vehicles, especially reversing ones. Others, particularly drivers and operators, are killed or injured by overturning vehicles and plant.

Falling material and collapses: People are struck by material falling from loads being lifted and material that rolls or is kicked off work platforms; others are struck or buried by falling materials when excavations, buildings or structures collapse. Structural collapses can range from walls, which fall because their foundations are undermined by nearby excavations, to buildings, which collapse during alteration works because the structure was weakened and/or overloaded. Structures can also collapse unexpectedly during demolition if action is not taken to prevent instability. Scaffolds collapse because ties are either forgotten or removed too early during striking, or the scaffold is overloaded. Structures under construction may also collapse, eg steel frames that have not been adequately braced, or formwork that is prematurely loaded.

Electrical accidents: People suffer electric shock and burns when they use unsafe equipment and when they contact overhead power lines and buried cables.

Trips: Trips are the most common cause of reported injuries on construction sites, with over 1000 major injuries each year. Most of these can be easily avoided by effective management of access routes such as corridors, stairwells and footpaths.

II. Health

The construction industry has a poor health record. Construction workers are likely to suffer ill health as a result of their work in the industry after exposure to both harsh working conditions and hazardous substances. Ill health can result from:

Asbestos: Exposure to asbestos can cause serious respiratory diseases such as asbestosis and cancer.

Manual handling: Lifting heavy and awkward loads causes back and other injuries. Some injuries can result from a single lift, but more commonly, long-term injury develops as a result of repeated minor injury due to repetitive lifting.

Noise and vibration: High levels of noise can cause hearing loss and repeated use of vibrating tools can cause hand-arm vibration syndrome (damage to nerves and blood vessels most commonly in the hands and fingers).

Chemicals: Exposure to materials such as cement and solvents can cause skin problems such as dermatitis.

2.5 Health and Safety Policy

Policy is deliberate of principle to guide decisions and achievement rational outcomes, it is a statement of intent, and is implemented as procedure or protocol. According to Hughes & Ferrett (2005) every construction organization should have a clear policy for the management of health and safety; and good health and safety policy will enhance the performance of the organization in areas other than health and safety, help with the personal development of the workforce and reduce financial losses and involves the development, monitoring and review of the standards needed to address and reduce the risks to health and safety produced by the organization. As stated by Hughes & Ferrett (2005) H&S policy of organizations required to entail a health and safety policy statement which includes the health and safety aims and objectives of the organization, a health and safety organizational structure detailing the people with health and safety responsibilities and their duties and the health and safety arrangements in place in terms of systems and procedures.

2.6 Health and Safety Regulations

According to Coglianesi (2012) Regulation are rules or norms adopted by government and can also derive from any number of institutional sources like parliaments or legislatures, ministries or agencies and it is seeks to change behavior in order to produce desired outcomes to advance public interest and improve problematic conditions on the public. To reduce risk of accidents on construction there should be regulations that address or would meet hazards on

workplace. According to Spiter (2011) health and safety regulations strive to reduce risks and dangers as much as is reasonably practicable. In order for these regulations to be effective, there exists the essential requirement of the existence of a system whereby duties and obligations are attributed to different persons involved in construction. The need for accountability for lack of safety measures is quintessential in an industry involving dynamic working relationships where numerous parties involved in a construction project, work alongside one another. As stated by Waziri, *et al.*, (2015) effective regulations are fundamental in ensuring employees state of work in the delivery of construction projects in safe atmosphere.

2.6.1 Health and Safety Contractual Regulations

Mzyece , *et al.*, (2012) Standard form contracts provide a platform for expressing health and safety contractual provisions. Embedded in a contract, these provisions will describe the obligations of either party making them accountable for their actions and to a large extent share project risks. Standard forms of contract include more direct reference to construction H&S, the construction regulations and the obligations of contractors as well as providing for additional client driven H&S requirements (Smallwood, *et al.*, 2009). According to Spiter (2011) starting from the moment an employment contract is signed between an employer and an employee, an obligation is created and imposed upon the employer to take care of the wellbeing of the employee in such a way that this duty could be deemed to be forming part of the terms and conditions of that same contract. Employer is contractually obliged to safeguard, provide a safe place of work and to maintain the workplace in a reasonable state of safety for the employees (due to contractually and that liability may be based on the breach of this contractual obligation).

Various nations have their own standard form of contract for construction works. For instance in UK Joints Contract Tribunal (JCT), General Conditions of Government Contracts for Building and Civil Engineering Works (GC/Works), The Engineering and Construction Contract (NEC3) and International Federation of Consulting Engineers (FIDIC) – Design Build Operate (DBO) contracts are used (Mzyece , *et al.*, 2012). Those standard contracts include clauses that state about health and safety measures taken on construction site.

In case of Ethiopia for international competitive bidding usually used FIDIC standard form of contract and for national competitive bidding where used public procurement agency (PPA/2011) standard form of contract.

2.6.1.1 H&S Regulations on Ethiopian Federal Public Procurement Contract (PPA/2011)

Ethiopian federal public procurement contract (PPA/2011) contains clauses that state about precaution contractor should have to take on construction sites other health and safety related issues. Precaution taken by contractor for Health and safety on site stated on part-3 Section 7 in general condition of contract on clause 45 and on the clause such as 34.2, 40.2 and others clauses state about obligations and requirements of health and safety measure should be taken by contractor. Among the requirements on the conditions of contract first aid service and insurance take out by contractor for employees employed under contractor are found.

2.6.1.1.1 First Aid Service

As labor department of New Zealand (2011) first aid is the immediate and basic care given to an injured or sick person before a doctor, other health professional or emergency services take over their treatment. It focuses on preserving life and minimizing serious injury by maintaining breathing and circulation, stemming blood, immobilizing broken bones etc. according to ministry of manpower of Singapore (2006) the life of an injured employee may depend on proper first-aid given within the first few minutes of an accident. Besides saving lives, first-aid treatment is important in preventing further injury and pain.

Provision of first aid service is contractually obligated for employer on general condition of contract of PPA/2011 on clause 45.10. Other international legal document like ILO Safety and Health in Construction Convention No.C-167, (1988) is stated employer to provide first aid service on construction site on article 31. In addition to ILO convention No. 167; ILO health and safety code of practice for construction (ILO, 1992) on article 17.3 required that employer to provide first aid service at work place and to ensure provision of trained first aider, first aid kit or box, first aid room and similarly legislation 424.13(2002) of red cross society put the

same requirements as stated by ILO code of practice in construction and put requirements of the minimum content of first aid boxes and regularly to check the stock of first aid box.

2.6.1.1.2 Insurance

Most employers are required by law to insure against liability for injury or disease to their employees arising out of their employment. HSE (2012) will give indication to whom employer are required by law to have employers' liability insurance for people who employer employ under a contract of service or apprenticeship. According the guide the employer may need employers' liability insurance for someone who works for employer where:

- You(employer) deduct national insurance and income tax from the money you pay them;
- you have the right to control where and when they work and how they do it;
- you supply their work materials and equipment;
- you have a right to any profit your workers make although you may choose to share this with them through commission, performance pay or shares in the company;
- you require that person only to deliver the service and they cannot employ a substitute if they are unable to do the work; or
- They are treated in the same way as other employees, for example, they do the same work under the same conditions as someone else you employ.

When we come to PPA contract; employers are required to takeout insurance on general condition of contract clause 40.2 to insure against liability for injury or disease to their employees arising out of their employment. Clause (40.2) required Contractor to take out insurance covering his liability with regard to industrial accidents and civil liabilities to any person employed by him on the works.

2.6.2 Legal regulations of Occupational Health and Safety

The primary objective of H&S legislation is the prevention of accidents with their consequences in terms of injury, disablement and fatality, and ill health within the work environment. The achievement of this objective depends on good legislation supported by effective, sensible and accountable enforcement (Smallwood, *et al.*, 2009). The Construction Regulations are perceived to have had a wide spread impact, and in particular increased H&S

awareness and increased consideration by project managers, and general contractors (Smallwood, 2006). So that the impact of H&S legislation is positive in reducing accidents that takes place on work.

In Ethiopia there are no specific law/directive/regulations for construction safety and health that encompass all hazards in construction industry. Including Constitution of the Federal Democratic Republic of Ethiopia there is various rules and regulations are provided to protect health and safety of employees. According to Constitution of FDRE article 42 “worker have the right to have safe and healthy working environment” therefore employer have obligation to make safe and healthy working environment. In Labor proclamation 377/2003 part-7 on chapter one article 92 preventive measure taken by employer and his obligation are provisioned in order to make safe and healthy Working Environment for employees. The ILO Convention, 1988 (No. 167) of Safety and Health in Construction set obligation and measures taken by employer, employee and regulatory bodies to ensure health and safety in construction. The detail guidance of this convention (C167), and Recommendation, 1988 (No. 175) are provided in ILO code of practice (1992) for Safety and health in construction. On civil code of Ethiopia (1960) as stated on article 2548 employer shall take such measures as required by the special circumstances of the work to safeguard the life, physical integrity, health and moral standing of the employee.

2.6.2.1 Health and Safety Requirements on Ethiopian Labour Proclamation 377/03

According to article 4 of the proclamation employee or worker is a person agrees directly or indirectly to perform work for and under the authority of an employer for a definite or indefinite period or piece work in return for wage.

Health and safety precaution requirements required by the proclamation from employer are various but in this section will see safety training, safety officer and safety committee, personal protective equipment and register and report employments accidents from article 92.

2.6.2.1.1 Health and Safety Training

Many studies found that training of worker improves safety of workers. For instance Adebayo & Emoh (2019) training of worker on simple basic proper usage of PPE has a significant impact on improving safety practice and operation of workplace. HSE² (2012) explain why

safety training is needed and state that providing health and safety information and training helps employer to ensure people who work for him/her (employee) know how to work safely and without risks to health, to develop a positive health and safety culture and to meet legal duty of employer to protect the health and safety of employees.

OH&S training is a very important aspect of H&S programme and it is legal requirement for employer/contractor. On article 92 sub article 2 of the proclamation employer required to provide safety training for employees. The required specific content or topics of training not prescribed on the proclamation but it is obvious that aim of providing training is to reduce and avoid accident if possible. California Department of Industrial Relations:Commission on Health and Safety and Workers' Compensation (2012) state that employer makes sure that the training program reaches all affected employees and that it covers all relevant topics. The training will be provided to all workers on the hazards in their workplace when they start working for their employer, whenever they are given a new job assignment, and whenever new procedures and equipment are introduced.

OSHA (2015) required employer provide training for employees on risks and hazards related to all construction operation and activities and employer required to permit only trained and qualified employees to perform activities and operate equipment. According to Safe Work Australia (2014) and Reese & Edison (2006) the training shall include hazards, risks and control measures involved in carrying out the task, relevant legal responsibilities, codes of practice or technical standards that must be followed and include other required training requirement topics related to workplace and task specific training. Similarly ILO code of practice (1992) on section 20.5 illustrate what the training of H&S should include and one of the requirement training shall include is the requirements of relevant safety and health regulations. In addition safety training shall include specifically on protections of common accidents in construction sites: such as falling from height, struck by falling materials, collapse of scaffold and structure, electrical accident and trips, etc. (HSE, 2006).

2.6.2.1.2 Health and Safety Officer

labour proclamation 377/2003 article 92 sub article 2 require employer to assign safety officer. Also on general condition of PPA/2011 contract on clause 45.6 contractor required to nominate health safety representative to liaise with public body engineer in all health and

safety matters. Safety officer have role on construction like monitors workplace activities to ensure that workers comply with company policies and government safety regulations, safety policy development, safety inspections, safety training, and accident investigations etc. (Tobias , 2019).

2.6.2.1.3 Safety Committee

Occupational health and safety committee is bipartite body composed by workers' and employer's representative, which is established at the workplace and is assigned to various functions intended to ensure cooperation between the employer and workers so as to achieve and maintain safe and healthy working conditions and environment. On article 92/2 of Ethiopian labour proclamation employer are obligated to establish health and safety committee. OH&S committee will greatly assist the employer in the implementation of a health and safety program. According to Comcare (2012) Health and safety committee established for the purpose of promoting and maintain interest of employees in health and safety issues, to make health and safety activities an integral part organization, to help reduce the risk of workplace injuries and illnesses, to help ensure compliance with federal and state health and safety standard etc. Also Subramani & Lordsonmillar (2014) list some responsibilities of health and safety committee; according to the authors H&S committee perform activities like identifying probable cases of accident, stimulating interest of employees on safety, rounding construction site to check unsafe conditions and unsafe practices, looking health hazards associated with handling and using of chemicals, explosive and other construction materials, and suggesting necessary remedial measure to ensure safety.

2.6.2.1.4 Protective Equipment, Clothing and Other Materials

As per ILO Convention, 1988 (No. 167) and code of practice for safety and health in construction (1992) on article 18; adequate protection against the risk of accident or injury to health, including exposure to adverse conditions, cannot be ensured by other means, suitable personal protective equipment and protective clothing, having regard to the type of work and risks, should be provided and maintained by the employer, without cost to the workers. Physical personal hazard such as struck by falling objects, limbs or body crush by heavy objects, struck by moving plant and equipment, physical damage caused by falls, trips, slips

etc. kind of accidents or injuries can be lessen by using PPE. According to HSE (2006) some PPE required in construction site are hard hats, footwear, goggles, gloves, safety harness system, and high visibility clothes. on Ethiopian labour Proclamation 377/2003 on article 92 sub article 3; employer required to provide protective equipment, clothing and other materials to worker and instruct how use the them.

2.6.2.1.5 Register/Record and Report Employment Accidents

California Department of Industrial Relations (2005) ask reason why recording employment accidents are important and said that operations are unsuccessful without adequate recordkeeping, which enables to learn from past experience and make corrections for future operations. Records of accidents, work-related injuries, illnesses and property losses serve as a valuable purpose which affords an efficient means to review the current safety and health activities for better control of operations, and to plan future improvements. HSE (2013) said that the report informs the enforcing authorities about deaths, injuries, occupational diseases, and dangerous occurrence, so they can identify where and how risks arise and whether they need to be investigated. And this allows the enforcing authorities to target their work and provide advice about how to avoid work-related deaths, injuries, ill health and accidental loss.

Recording and reporting employments accident is important to have reliable statistical data on work-related deaths, injuries, occupational diseases and cause of each accident. According to Silva & Nawarathna (2014) availability of consolidated reliable data source is difficult tasks if there is lack of effective accident reporting procedure and centralized recording system for construction industry. On proclamation 377/2003 on article 92 on sub article 4 employers is obligated to register and report employment accident and occupational diseases.

2.7 Health and Safety Compliance

Compliance of health and safety is complying/obeying of the construction Health and Safety Act (OH&S Act) and the construction regulations (Smallwood, et al., 2009). Comply with health and safety regulation is build better performance for business. According to Adeyemo & Smallwood (2017) the performance of construction projects can be improved by addressing occupational health and safety (H&S) legislation to safeguard the H&S of workers and the entire community. Compliance with H&S system requires costs and benefits as a return.

According to HSE (2003) to comply with health and safety system organization spend costs for the expenditures mainly comprised of training, procurement of equipment, employee/management time, the cost of employing a designated health and safety person, implementing control measures, and the cost of health and safety software packages. Also comply with H&S regulation will give benefits in number of ways. According to Beakon (2018) the benefits of compliance with health and safety systems are include Reduced sickness absence, Decrease in the time lost through accidents, Decrease in the number of reportable accidents, Protection for the organization against litigation, decrease compensation fee and medical expense, Enhanced company reputation, Safer working environment, increased performance/productivity, Reduced insurance premiums etc.

2.8 Factors Affect Compliance with occupational Health Safety Regulations

The factors affecting contractors' compliance with OH&S regulation been identified by various authors. They are discussed in the following sections.

2.8.1 Lack of Commitment and Negligent Attitude of Contractor's Management to OH&S

Success with Occupational Safety and Health does not happen automatically, it requires commitment. Hamida, *et al.*, (2015) one of the main causes for accident is the lack of commitment shown by the construction management on handling OH&S issues in the construction industry. Consequently, as one of the key aspects for implementing safety interventions, the management commitment to safety should be given acknowledgement and emphasis in enhancing the safety of a workplace. According to Windapo & Oladapo (2012) commitment and attitude of management towards OH&S affect compliance and non-compliance of health and health & safety regulations. When management is not committed and negligent it highly affects compliance H&S regulation. According to Othman (2012) lack management commitment of management is the main reason for non-conformance of health and safety regulations. Haupt and Smallwood (1999 cited by Windapo & Oladapo, 2012) determines that the most common issues with regards to non-compliance with regulations were that workers were never consulted about health and safety by management. Bayram (2018) found that management commitments to OH&S affect safety performance. When a top

management make a commitment it results the establishment of health and safe working environments under the leadership and commitment of top management and increasing employee satisfaction reduce the occurrence of workplace accidents and injuries. Windapo (2011) Conclude that attitude of site manager is probable reason for compliance and non-compliance to H&S legislative requirements on construction sites. There is significant relationship between the attitude of site manager to level of compliance to health and safety legislative requirements on site.

2.8.2 Less Severe Penalties for Noncompliance

Companies pay a specified sum of money for volition or nonconformance of regulations. Penalty payment has the effect of providing relatively strong incentives to meet the specified minimum level of requirement. If the magnitude of this payment highly less severe it do not deter offender even when enforced. According to Okojie (2010 cited by Umeokafor, *et al.*, 2014) insignificant penalties to offender or non-compliance of regulations will not guarantee compliance by any means and suggests that the penalties should be severe and when that is it can may serve as indirect instruments for implementing health and safety regulations; Umeokafor, *et al.*, (2014) also found that severity of penalty limit the optimum implementation of OH&S regulations. Adeyemo & Smallwood (2017) put that severity of penalty to offender influence successful implementation of OH&S regulations in construction industries. Adrison (2008) found from the study that an increase in penalties would lead to increase in compliance. In other words the opposite of this will increase noncompliance. It means that minimum penalty does not enhance level compliance.

2.8.3 Lack of Strict Enforcement of Legislation by Competent Authority or Officers

The enforcement of any type of regulation is basically crucial for ensuring the efficacy of such regulation (Waziri, *et al.*, (2015). According to Idubor & Oisamoje (2013) it is all well and good to make laws, those laws are useless if they are not complied with, they cannot be enforced or enforced only in a certain circumstances and for certain individuals. Lack of proper enforcement of health and safety regulations often permits non-compliance which consequently contributes to poor state of occupational health and safety. According to Nzuve & Lawrence (2012) low level of inspection and examination of workplace might determine

the level of OH&S regulation compliance in workplace and similarly Othman (2012) lack of supervision to enforcement of OH&S procedures causes noncompliance. This implies that enforcement of regulations by authority may determine the level of compliance and influence implementation of OH&S regulation by contractors. Lucy, *et al.*, (2016) found that inadequate enforcement of the existing building rules and regulations affect health and safety performance of laborers. Ministry of labour and social affair (MOLSA) is responsible body to enforce regulation of health and safety in Ethiopia. MOLSA (2006) the mission and responsibility of MOLSA is to promote effective, healthy and peaceful industrial relations through promoting social dialogue and to ensure good labour administration, with occupational safety and health services at both national and regional levels.

2.8.4 Limitations in the Present OH&S Legislation

Adeyemo & Smallwood (2017) stated that limitations in the H&S regulation affect successful implementations of the regulations. If the regulation is limited and don't contain specific requirements accordingly to the related hazard to the occupation; it is difficult in terms of interpreting and applying the law. It is suggested that there must be specific H&S legislation for construction industry and there should be new H&S legislation that would meet the present-day construction hazard.

2.8.5 Lack of Management Awareness and Understanding towards OH&S Rules and Requirements

According to Windapo & Oladapo (2012) lack of awareness and understanding of health and safety legislation by management is contributing factors for non-compliance with OHS regulations by contractors. Omran, *et al.*, (2008) said that lack of awareness and understanding of OH&S regulation contributes to the low implementation of safety and health requirement at the construction sites. It is management responsibilities to provide knowledge and understanding to the employees. Management themselves must also be well equipped with the rules and knowledge of these safety requirements.

2.8.6 Minimal Impact of the Government in Managing and Regulating OH&S

Rantanen (2005 cited by Umeokafor, et al., 2014) states that the low prioritization level of occupational health in national health policies contributes to the decline in the development of

occupational health services. The government should play great role on improving health and safety of worker by making and formulating necessary policy, regulations and directives required to safeguard the life and health of workers at various workplace. It should have care for the safety of workers by enforcing existing health and safety regulations and if there is limitation on existing regulation it should have review as necessary. Umeokafor, *et al.*, (2014) Absence of the state involvement in OSH promotion and enforcement is of great concern. Because of influence of central government for implementation of OH&S regulation might determine the H&S compliance.

2.8.7 Lack of Knowledge and Training of Workers

workers must be trained on safety awareness, risk identification, hazard management, use of safety wear, use of first aid and proper use of varieties of safety equipment, such as fall arrest systems because no matter how good health and safety policy of construction companies is without passing knowledge or safety awareness to the workers the policy may failed and accident will continue (Adebayo & Emoh, 2019). Smallwood (2002 cited by Windapo & Oladapo, 2012) state that lack of training is major cause of noncompliance by workers with H&S legislation on construction sites. Workers that are not trained would not be knowledgeable or aware, and are consequently unable to properly comply with requirements and will underestimate the inherent risks/hazards in their work. Okoye, *et al.*, (2016) founds that there is positive relationship between health and safety knowledge and compliance to health and safety rules. The need for compliance with OH&S regulations is to minimize & as much as possible to avoid accidents happen on construction sites and that cannot be true with unknowledgeable and untrained workers.

2.8.8 Cost of Compliance

Applying safety system or to compliance with H&S regulations required to expend additional financial cost. Muhammad & Abdulateef (2015) in order to maintain a healthy working environment, the cost of safety are those incurred in order to comply with legal requirements with respect to accident prevention, to implement measures to prevent accidents during construction work and to improve health and safety conditions in all areas of the work performed. Muhammad & Abdulateef (2015) found that implementing a health and safety

policy increases the cost of the projects. According to Smallwood, *et al.*, (2009) implementing of H&S systems within a company which it is estimated to cost between 0.5% and 3% of total project costs. Idubor & Oisamoje (2013) marked that constructors often seen the prevention of accidents, improvement of working conditions and enforcement of standards as cost to business. Muhammad & Abdulateef (2015) conclude that implementing health and safety programs on construction site tend to increase the overall project costs.

2.8.9 Lack of OH&S Legislation for Construction Industry

Lack of specific health and safety regulation for the construction industry seriously limits & handicaps the implementation of health and safety standards on construction sites. There are a number of concerns regarding the implementation of regulations. According to Kheni & Braimah (2014) first, regulations are needed to set standards for specific situations. In the absence of these standards, employers wishing to comply with the requirements of the law will adopt standards which are very subjective. According to Adeyemo & Smallwood (2017) non-inclusion of construction industry on regulation makes it difficult for construction stakeholders to adopt the regulation. In Ethiopia there is no specifically developed health and safety regulation in particular for construction industry. Health and safety regulations for construction works must address specific risks and hazards during performing construction tasks and shall set specific requirements and standard or measures shall be taken by contractors and workers.

2.8.10 Workers' Attitude towards the Practices OH&S

According to Omran, *et al.*, (2008) the success implementation of safety and health requirements also lies in the attitude of workers towards these issues. Workers should be more positive and adaptable towards the various strategies used to implement requirements of regulations. A workers' attitude also includes getting information from the company, involving in the training provided, following the safety procedures and policies.

2.8.11 Lack of Skilled and Competent Personnel for Occupational Health Services

Study conducted by Idubor & Oisamoje (2013) and Adeyemo & Smallwood (2017) determined that shortage of skilled and competent officer is challenge for implementation of H&S regulations.

2.9 Enforcement of Health and Safety Regulations

The enforcement of any type of regulation is basically crucial for ensuring the efficacy of such regulation (Waziri, *et al.*, 2015). According to Idubor & Oisamoje (2013) lack of proper enforcement of health and safety regulations often permits non-compliance which consequently contributes to poor state of occupational health and safety. MOLSA is responsible body to enforce regulation of health and safety in Ethiopia. According to Ethiopian Building Proclamation 624/2009 urban administration/building officer is also responsible and involve in ensuring health and safety of properties and general public.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Study Area

This study was conducted in Addis Ababa city. Addis Ababa is the capital city of Ethiopia, it is located 9°1'48" N 38°44'24"E. It is largest city in the country by population with a total of 3,384,569 according to the 2007 census. The city of holds 540 square kilometers area in Ethiopia and population density estimated to be nearly 5,165 individuals per square kilometer. The city has divide in 10 sub-cities. As capital and developing city there is high number of private and public building construction are constructing on each corner of the city.

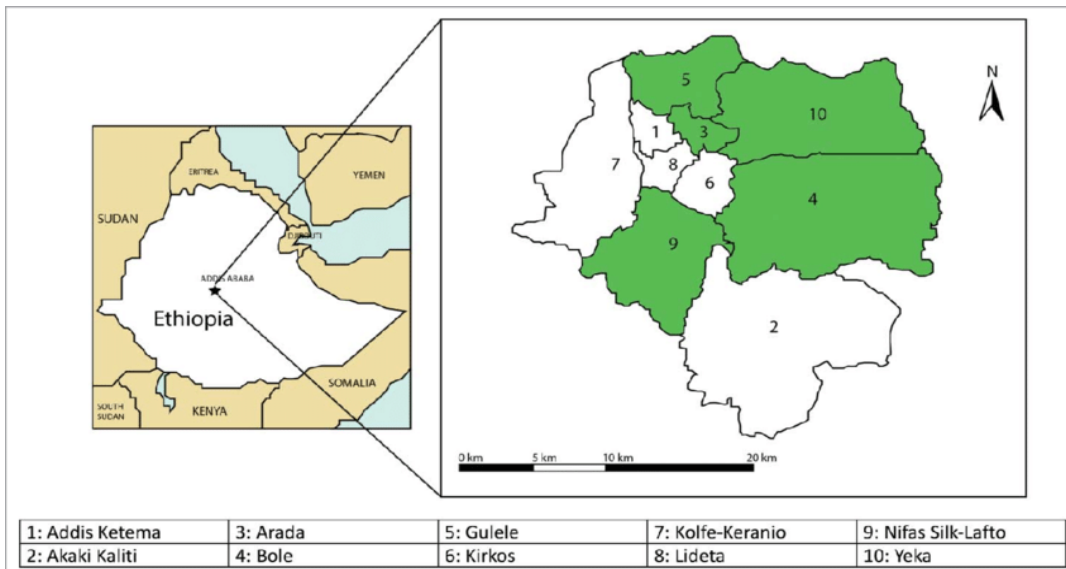


Figure: 3.1 Location Map of Addis Ababa

3.2 Research Design

Descriptive survey method is adopted for this study. Descriptive research design method is flexible in nature and useful in non-experimental study that to seek to describe reality and significant in gathering information from target population of study. This research design good to analyze qualitative and quantitative data. The data collected qualitatively often possibly analyzed quantitatively using frequency, percentages, averages, or other statistical

analyses to determine relationships of phenomenon with this type of research design (Nassaji, 2015). Figure 2 below shows the research design follow chart was used for the study.

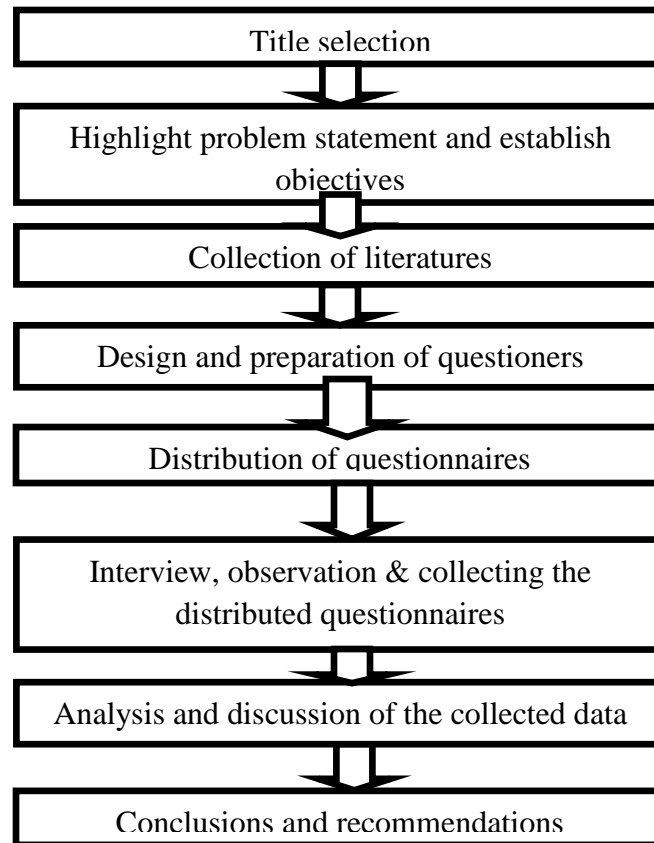


Figure 3.2: Flow chart showing research design

3.3 Study Variables

3.3.1 Dependent Variable

- Contractual and legal occupational health and safety regulations compliance

3.3.2 Independent Variables

- First aid medical service
- Employees insurance
- Safety training
- Appointment of Safety officer
- Safety committee
- Personal protective equipment(PPE)

- Registering and reporting employment accident

3.4 Target Population of the Study

The target population is the entire population, or group, that a researcher is interested in researching and analyzing. The total public funded building project constructing by grade one contractor according to the data from Addis Ababa construction bureau is over 25 but 16 of them are active and involving construction under scaffold, working at height and have large number of labours at time of this study. From that of 16 active sites 14 sites identified and investigated for this study. From that of 14 sites contractor’s personnel in the form of project manager, safety officer, site engineer, construction engineer, office engineer and human resource manager are targeted for the study. From Addis Ababa bureau of labour and social affair(AABOLSA) bureau health and safety expert, health and safety manager and labour inspectors are included specifically for the seek of the third objective of study. According to article 178 and 179 of Ethiopian labour proclamation 377/2003 labour inspectors are legally authorized body to enforce health and safety regulation in work place and to take measures when employer fail to comply with health and safety requirements on proclamation and if any unsafe condition is observed. Because of this researcher decided to involve AABOLSA department of industrial peace to obtain data addition of construction sites personnel for the third objective of this study.

3.5 Sample Size and Sampling Technique

Purposive sampling method was be used to select construction sites for this study. The construction site is selected based characteristics of sites like involving concrete work, involve large number of workers, involving working on height and scaffold. The sample size of target sites will be determined by using the following formula as used by different researchers like (Hassanein & Hanna, 2008)

$$n = n' / (1 + \frac{n'}{N}) \dots\dots\dots \text{Equation 3.1}$$

Where; n’ is the sample size from infinite population, which can be calculated from the following formula:

$$n' = s^2 / v^2 \dots\dots\dots \text{Equation 3.2}$$

n: sample size from finite population

N: Total population (16 active public building project was constructing by grade one local Contractor at time of study)

V: Standard error of sample population equal 0.05 for the confidence level 95 %=1.96

S: Standard error variance of population elements, where $s^2 = (1 - P)$; maximum at $P = 0.5$

The sample size for project/sites population calculated from equation 2 as follows:

$$n' = s^2/v^2 = (0.5)^2/(0.05)^2 = 100$$

The size of sample was calculated by using equation 1 as follows:

$$n = n' / (1 + n'/N) = 100 / (1 + 100/16) = 13.79 \approx 14 \text{ sites}$$

Fourteen (14) sites therefore were studied. On each sites; average of two questionnaires were distributed randomly for site worker in the form of project manager, safety officer, site engineer, construction engineer, office engineer, and human resource manager. Therefore 28 questionnaires were distributed. From AABOLSA department of industrial peace ten (10) or all most all population working in the form of health and safety expert, health and safety manager and labour inspectors was taken as sample. Therefore totally 38 questionnaires were distributed for the study and 35 is returned and used for analysis.

3.6 Sources of Data

Primary and secondary sources of data were used. project manager, site engineer, construction engineer, office engineer, human resource manager, health and safety expert and labour inspector are considered as primary sources of data for the study and as well target population. Primary source of data are more credible as evidence and provide raw information. Because of this target population selected as primary source of data for raw and genuine information.

The secondary data were used in this study are: academic journals, related books, legal documents, articles of different authors, information from web site which contain related and relevant subject to the study.

3.6.1 Data Collection Methods and Procedures

Primary data was collected through questionnaires, construction site observation checklist and focused respondent's interview involving project manager, safety officer and site engineers. The Secondary data were obtain through the review of various relevant literatures were used to carrying out the research.

The questionnaires consisted both open and closed ended questions providing both qualitative and quantitative data. The questionnaires have four parts. The first part of the questionnaires contains the general information of studied companies and respondents. The second part of questionnaires contains general requirements of health and safety which selected for the study from contract and proclamation. This part of questionnaire is adopted to determine the awareness of respondents on the issue. The third part of questionnaires contains the health and safety general requirements required by contract and proclamation. Beside of general requirement it included some specific requirements developed from international health and safety code of practice, books, guidelines, and journals. This part of questionnaires adopted to determine OH&S regulation compliance level on construction sites. The fourth and last part of questionnaires contains factors affecting to comply with health and safety regulation requirements.

As per the data collection methods, structured questionnaires was prepared based on research questions and objectives then it was distributed to the sampled population by researcher for filling by respondents and then collected. At the same observation and interview were conducted.

To investigate the issue in depth and to discover individuals thinking and feeling and also to clarify ambiguities if any when respondents filed questionnaires; interviews were conducted with one of each respondent of studied construction sites. Also some of employees from AABOLSA bureau department of industrial peace were interviewed.

To describe the existing situation and safety practice on studied sites worker observation checklist and notes were used as data collection methods. This method of data collection helps the researcher to identify the real and actual site safety practice on the ground.

3.7 Validity and Reliability

Validity of research instrument (questionnaires, interviews guide, observation checklist) has been checked to measure the extent to which research instrument should measure or represent the variables they are intended to measure. To construct validity, literature review were conducted and thoroughly examined to make sure that the content of measuring instrument is relevant to study variables. Questionnaires were reviewed by advisors. Advisors were requested to identify the internal validity and to what extent it is suitable to be used as an instrument to realize the research aim. They ensure that the items covered all relevant issues under investigation. A pilot study was conducted with a few respondents at two separate times to test reliability of the instrument. Then after the questionnaire is adjusted and then distributed to the respondents. To test the internal consistency of the questionnaire result, “Cronbach’s alpha” was used and found to be 0.80 and which is adequate reliable. According to George & Mallery (2003) Cronbach’s alpha value which greater than 0.7 is acceptable.

3.8 Data Analysis and Presentation

When the filled questionnaires had been collected, data processing was carried out. Coded broad sheets were used for extracting data from the returned questionnaires. Frequency, percentage and relative importance index (RII) were used for the descriptive data. Tables were used for presentation of data because this method provides easier understanding and clearer picture of information to be delivered. The researcher was used Microsoft excel for data analysis. The data obtained through interview was analyzed in the form of narration and presented with combination of information in questionnaires.

The results of study are presented and analyzed as per the study objectives; for first and second objective percentage was used and for the third study objective RII was used for presentation and ranking. RII is used to rank the factors that affect compliance with OH&S rules and regulations. The RII is given as follows:

$$RII = \frac{\sum w}{AN} = \frac{5n_5 + 4n_4 + 3n_3 + 2n_2 + 1n_1}{5N} \dots\dots\dots \text{Equation 3.3}$$

Where w = is the weighting given to each factor by the respondent, ranging from 1 to 5

A = is the highest weight (i.e. 5 in the study)

N = is the total number of samples

n_1 = number of respondents who answered ‘‘strongly disagree’’

n_2 = number of respondents who answered ‘‘Disagree’’

n_3 = number of respondents who answered ‘‘Neutral’’

n_4 = number of respondents who answered ‘‘Agree’’

n_5 = number of respondents who answered ‘‘strongly agree’’

3.9 Ethical Consideration

All respondents were treated with courtesy and respect hence avoiding misunderstanding on respondents and they were informed of the purpose of the study. Each respondent was politely requested to fill the questionnaires and assured of confidentiality with regard to any information they gave. The data, results, methods and procedures were truthfully reported in this study

CHAPTER FOUR

RESULT AND DISCUSSION

4.1 Response Rate

Respondents of this study were drawn from contractors personnel purposively selected from fourteen (14) construction sites who involved in public building construction project in Addis Ababa and from Addis Ababa bureau of labour and social affairs. Out of 38 questionnaires distributed, 36 were returned. Out returned questionnaires 35 were used for the study. 35 or 92.1% represent a reliable response rate and since it is above the minimum acceptable threshold and adequate for analysis. According to Babbie (2002), any response rate of 50% and above is adequate for analysis. Table 4.1 below indicates the analysis of response rates of questionnaires.

Table 4.1: Response rate

Response rate	Frequency	Percentage (%)
Distributed	38	100
Returned	36	94.74
Valid response and used for analysis	35	92.1
Invalid response	1	2.63

Source: survey data, 2019

4.2. General Information about study Organizations

4.2.1 Types of Organization

Grade one (1) Building and General construction contracting companies and Addis Ababa bureau of labour social affair department of industrial peace were participated to carry out this study by questionnaire filling and interviews. The rates of respondents in organizational level are: 7.89% from General Contractor, 65.79% from Building Contractor and 26.32% from AABOLSA. Table 4.2 shows the analysis results of types of organization participated on the study.

Table 4.2: Type of organization were participated on study

Types of organization	Frequency of distributed questionnaires	Percentage (%)
General contractor	3	7.89
Building contractor	25	65.79
AABOLSA	10	26.32
Total	38	100

Source: survey data, 2019

4.2.3 Categories of Construction Company by Ownership

Both Private and governmental construction companies were involved in this study. Among from 14 construction companies studied; one is public and the rest thirteen (13) are private companies. Table 4.3 below shows that the results of categories of construction companies by ownership.

Table 4.3: Categories ownership of companies

Categories	Rate
public	1
private	13

Source: survey data

4.2.4 Number of Project Executed in the Last Five Years

The respondents were asked the number of projects the company executed in the last five years; accordingly, 50% of companies involved in this study execute in the last five year more than 10 projects, 35.71% of companies execute in between 5-10 projects and 14.28% companies execute less than five projects in the last five years respectively. This implies that the companies involved in the study more or less have experience related to health and safety issue on building construction projects. Table 4.4 below indicates the results of number of projects executed in the last five years by studied construction companies.

Table 4.4: Number of projects executed

Number of project	frequency	Percentage (%)	Cumulative (%)
Less than 5	2	14.28	14.28
5-10	5	35.72	50
Greater than 10	7	50	100
Total	14	100	

Source: survey data, 2019

4.2.5 The Value of Project Executed in the Last Five Years

According to survey data 92.86% of the companies involved in the study execute project have value more than 100 million and 7.14% of companies execute project with value in between 20-50 million ETB. These indicate there is high turnover in the companies. In other word it indicates the financial capacity or status and the companies' involvement on larger projects. Another implication of this is the companies use large number of workforce and equipment. Table 4.5 below shows the results of values of projects executed in the last five years by studied construction companies.

Table 4.5: Value of projects executed in the last five years

Project Value in ETB (in million)	Frequency of Company	Percentage (%)	Cumulative (%)
20-50	1	7.14	7.14
Greater than 100	13	92.86	100
Total	100	100	

Source: survey data

4.2.6 Number of Employees on Project

As shown in table 4.6 below more than half of companies involved in this study have greater than fifty (50) employees and this show that most of them are executing large projects requiring and involving high number of laborers and professionals. Table 4.6 below shows that the results of number of employees worked on studied construction projects.

Table 4.6: Distribution of Employees Number on the construction projects

No of employees	Frequency	Percentage (%)	Cumulative (%)
Less than 25	3	21.43	21.43
26-50	2	14.28	35.71
51-100	6	42.86	78.57
151-200	2	14.28	92.85
Greater than 300	1	7.14	100
Total	14	100	

Source: survey data

4.3 Demographic Characteristics of Respondent

This section will discuss the respondent's educational level, the position on the project, and years of work experience

4.3.1 Distribution of Respondents by Work Experience

Distribution of contractors personnel involved in studied public building projects in Addis Ababa and those from AABOLSA by level of work experience are distributed as follows: respondents those with experience less than 5 years are 48.57%, those with in between 5 & 10 years are 28.57%, those with between in 11 & 15 years are 20% and the rest 2.86% have experience in between 16 & 20 years. Table 4.7 below indicates the distributions of respondents by level of work experience in years.

Table 4.7: Distribution of respondents by work experience

Level of experience (in years)	Frequency	Percentage (%)	Cumulative Percentage
Less than 5	17	48.57	48.57
5-10	10	28.57	77.14
11-15	7	20	97.14
16-20	1	2.86	100
Total	35	100	

Sources: survey data, 2019

4.3.2 Distribution of Respondents by Level of Education

The respondent's higher level educations were asked and the findings of study show that respondents who had attained bachelor degree are more than half. The distributions of respondent's educational level are as follows: 2.86% respondents had attained diploma, 74.28% respondents had attained bachelor degree and 22.86% respondents had attained master's degree. Table 4.8 below shows the distribution of respondents by level of education.

Table 4.8: Distribution of respondent by educational level

Level of education	Frequency	Percentage (%)	Cumulative Percentage
Diploma	1	2.86	2.86
Bachelor degree	26	74.28	77.14
Master's degree	8	22.86	100
Total	35	100	

Source: survey data

4.3.3 Distributions of Respondents by Position of Work on the Project

Respondents were asked to specify their work position in the project. The result of study shows that respondents work on the project as a site engineer, project manager, health and safety manager, health and safety expert, labour inspector, office engineer, construction engineer and human resource manager. Table 4.9 below indicates rate of distribution of respondent's with position of work in the organization.

Table 4.9: Respondent's positions of work

Respondents Position of work	Frequency	Percentage (%)	Cumulative Percentage (%)
Health and safety manager	5	14.28	14.28
Health and safety expert	2	5.71	19.99
Labour inspector	5	14.28	34.27
Project manager	6	17.14	51.35
Site engineer	8	22.86	74.21
Construction engineer	4	11.43	85.64

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Office engineer	4	11.43	97.07
Human resource manager	1	2.86	100
Total	35	100	

Source: survey data

4.4 Opinions of Contractor’s Site Personnel on Obligation of Contractor towards Contractual and Legal Health and Safety Regulation Requirements and Its Health and Safety Benefits.

Respondents from fourteen (14) investigated sites were asked questions to determine their awareness/ opinion on health and safety requirements stipulated on proclamation and conditions of contract particularly on selected requirements for this study. The response of respondents on the given statements are presented and discussed as follows on the section below.

4.4.1 Providing First Aid Service

The respondents were asked their opinion on provisions of first aid medical service at workplace. According to survey 96% of respondents think that providing first aid service is essential for construction site in preserving the health and safety of employees. Although, 92% of respondents agreed that providing first aid service on construction site is obligatory for contractor. The results imply that most respondents aware about the H&S benefits of first aid service and obligation of contractor to provide the service on construction site. Table 4.10 shows analysis of reflection of respondents on the given statement about first aid service.

Table 4.10: Respondents opinion provisions of first aid service on site

Questions on first aid service	Frequency		Percentage (%)	
	Yes	No	Yes	No
Providing first aid service is essential in preserving the H&S of employees	24	1	96	4
Contractor has obligation to provide first-aid facility on site construction site	23	2	92	8

Source: survey data, 2019

4.4.2 Insurance for Employees

The respondents were asked about H&S benefits and obligation of contractor to insure employees; accordingly 92% of respondents agreed that insuring employees are important on the matter of OH&S. Also 84% respondent agreed that contractor has an obligation to takeout insurance for him/her employees. Table 4.11 indicates the results of opinion of respondents on obligation of contractor to take out insurance for employees its benefits.

Table 4.11: Respondent opinion to insure employees

Questions on employees insurance	Frequency		Percentage (%)	
	Yes	No	Yes	No
Takeout insurance for employees are important for contractor on matter related to H&S	23	2	92	8
Contractors has obligation to takeout insurance or insuring employees	21	4	84	16

4.4.3 Employees Training

The respondents were asked their view on providing training for employees. 88% of respondents are sure that to train employees on OH&S issues reduce accidents will happen on building construction sites. 88% of respondents are agreed or say ‘‘Yes’’ on the statement ‘‘Contractor has an obligation to provide training for employees on OH&S issues’’. This result implies that most respondents have no awareness problem on necessity of providing training and contractors’ obligation to provide training on OH&S to construction worker. The result indicates respondents views on provision of safety training and on obligation of contractor to providing training on OH&S issues are shown on table 4.12 as follow.

Table 4.12: Respondents opinion on employees training

Questions on H&S training	Frequency		Percentage	
	Yes	No	Yes	No
Providing training for workers on health and safety issue reduce risk of injuries and diseases	22	3	88	12
Contractor has obligation to provide training for workers	22	3	88	12

Source: survey data, 2019

4.4.4 Appointing health and safety officer

Respondents were asked about health and safety benefits of appointing safety officer and contractor obligation to recruit or appoint safety officer on construction site. The survey data shows that 92% of respondents agreed that appointing safety officer for construction site have safety benefits. And 84% of respondents say that contractor has obligation to appoint safety officer for construction site. The result indicate that majority of respondent know the H&S benefits of appointing safety officer on construction site and contractor’s obligation to appoint safety officer. Tables 4.13 shows the analysis result of respondents views on the statement provided on appointing health and safety officer to construction site.

Table 4.13: Respondents Opinion on Appointing Health and Safety Officer

Questions on appointing H&S officer	Frequency		Percentage (%)	
	Yes	No	Yes	No
Appointing safety officer benefit in reducing accident rate and to ensure safety of employees	23	2	92	8
Contractor has obligation to appoint or recruit safety officer for construction sites	21	4	84	16

Source: survey data, 2019

4.4.5 Establishing Health and Safety Committee

The respondents were asked their opinion on establishing health and safety committee at work place. Result of study show that 88% of respondent agreed that establishing health and safety committee at work place improves H&S of site worker. Another question respondent were asked is whether contractor have an obligation to establish H&S committee or not; 76% of respondents agreed that contractor have an obligation to establish H&S committee and 24% not agreed or say that contractors not have an obligation to establish H&S committee. Table 4.14 indicate rate of respondents agreement and disagreement on the given statement related to establishing OH&S committee on workplace.

Table 4.14: Respondents opinion on establishing health and safety committee

Questions on establishing H&S committee	Frequency		Percentage (%)	
	Yes	No	Yes	No
Establishing health & safety department/committee improves health & safety of worker	22	3	88	12
Contractor has obligation to establish health and safety committee	19	6	76	24

Source: survey data, 2019

4.4.6 Personal Protective Equipment (PPE)

The respondents were asked about health and safety benefits of PPE and obligation of contractor to provide PPE. According to survey result 96% of respondents believe that using PPE improve health and safety of employees. The second statement were the respondents asked is that ‘‘Contractor has an obligation to provide PPE to workers by him/her cost’’ and results shows that 88% of respondents agreed on this statement. This implies most of respondent agreed or know that PPE improve safety of employees and costs of PPE is belongs to contractors. Table 4.15 shows that respondent’s perception on the given statement related to provisions of PPE for employees on construction sites.

Table 4.15: Respondent perception on PPE

Questions on providing PPE	Frequency		Percentage (%)	
	Yes	No	Yes	No
PPE helps to improve health and safety of employees	24	1	96	4
Contractor has obligation to provide PPE by him/her cost to the employees	22	3	88	12

Source: survey data, 2019

4.4.7 Record and Report Employment Accident

The respondents were asked to identify their opinion on record and report employment

accidents. Result of study show that 88% of respondent agreed that register and report employments accident is important but 12% of respondents not agreed or say that recording and reporting of employments accident and diseases is not important. The second statement is that ‘Contractor has obligation to register and report employment accident and disease’; on this statement 80% of respondents agreed that contractor have an obligation to record and report employment accident and diseases and 20% of respondents said that contractor has no obligation to record and report employment accident and diseases. The result indicates that majority of respondent have awareness on H&S benefits of recording employment accident and disease and contractor’s obligation to record it. Table 4.16 indicates respondents view on given statement related to registering and recording employment accidents and diseases.

Table 4.16: Respondents opinion on recording and reporting employment accident

Questions on recording of employment accident	Frequency		Percentage (%)	
	Yes	No	Yes	No
Register/record and report employment accident is important	22	3	88	12
Contractor has obligation to register and report employment accident and disease	20	5	80	20

Source: survey data, 2019

Taking any necessary preventing measure for health and safety of employees as an employer starts from having the right awareness on the issue. According to Hu, et al, (1998) employer more aware of their responsibilities in the regulation take necessary safety measure than an employer who were less aware of their responsibilities. The results of study as indicated from section 4.4.1 to 4.4.7; majority (on average 91%) of respondents have positive awareness on health and safety benefits of the given requirements or they are believed that providing first aid service, employees insurance, safety training, appointing safety officer, establishing safety committee, personal protective equipment and registering/recording employment accident have positive impact to maintain health and safety of employees. The interviews results also conform this. According to interviewed respondents they are often asked or requesting contractor especially to provide enough PPE for employees. In other way on average 85% of respondents know that contractor has an obligation to provide first aid service, to takeout

insurance for employees, provide safety training for employees, to appoint health and safety officer, to establish safety committee, to provide personal protective equipment and registering/recording employment accident.

4.5 Contractual and Legal OH&S Regulation Compliance Level Building Construction Projects

One of the research aims is to identify the extent which health and safety requirement stipulated on labour proclamation 377/2003 and in the general condition of contract of public procurement agency (PPA) version of 2011 are implemented on public building project in Addis Ababa. The research examine OH&S practice of selected construction projects/sites based on some identified H&S requirements on article 92 of labour proclamation 377/2003. The requirements taken as bases for evaluations of OH&S practice from proclamation are employees training, safety officer, health and safety committee, and personal protective equipment, register and report employment accident. From PPA conditions of contract the requirement taken for evaluations are insurance for employees employed by contractor according and bases on general condition of contract clause 40.2 and first aid service/facilities according to clause 45.10.

This section shows the results of evaluations of fourteen (14) studied construction sites. The sites were evaluated based on general requirements mentioned above and sub-specific requirements drawn from literature, international legal document and related guidelines.

4.5.1 First Aid Service

Respondents were asked about provision first aid service on construction site. Result of investigation show that twelve (12) construction site or 85.71% provide first aid service. When we comes to specific requirements; twelve (12) or 85.71% of construction sites have first aid kits and six (6) or 42.86% of construction sites have first aid room or place to provide the service to injured worker and five (5) or 35.71% of construction sites have and appoint trained first aider or nurse to provide the service. Half or 50% of sites reveal that they have serviceable and sufficient supply of first aid items. Table 4.17 below shows that the results of evaluation of first aid preparedness of studied construction site.

Table 4.17: Results of first aid service on sites

No_	First aid requirements	Frequency(by sites)		Percentage (%)	
		Yes	No	Yes	No
1	First aid service available on construction site	12	2	85.71	14.29
1.1	First aid boxes (KIT) available at workplace	12	2	85.71	14.29
1.2	First aid room or place to provide first aid service is available on site	6	8	42.86	57.14
1.3	Qualified/certified nurse or trained first aider appointed/assigned for first aid service on site	5	9	35.71	64.29
1.4	First aid items properly maintained in a serviceable condition and in sufficient supply	7	7	50	50

Source: survey data, 2019

First aid service is important in life saving of injured workers. According to ministry of manpower of Singapore (2006) the life of an injured employee may depend on proper first aid given within the first few minutes of an accident and besides saving lives, first aid treatment is important in preventing further injury and pain. Contractor is required to provide first aid service/facilities on clause 45.10 of general condition of contract (PPA/2011). HSE² (2013) and ILO code of practice for construction (1992) on article 17.3.8 employer/contractor required to provide first aid room or station under the charge of first aid personnel or nurse. It is clear that the sites that haven't trained first aider and were not appointed first aid service provider or personnel cannot be simple considered as they are provide the service because emergency treatment for common accidents or injuries like head injury, broken bones, burns, electrocution, illnesses due to toxic chemical exposure etc. will happening on construction sites cannot be treated by any ordinary person before taken the injured employee to hospital or professional help arrives. The stock of first aid item shall be regularly checked and properly

maintained. The above result indicates that five (5) construction sites only fulfill first aid kit among given requirements and they are considered providing first aid service.

4.5.2 Insurance Coverage for Employees

Respondents from studied construction sites were asked whether employees are insured or have insurance coverage or not. Study result shows that five (5) or 35.71% of construction sites have insurance coverage for employees and 64.29% or nine (9) construction companies did not insure their employees. But only four (4) or 28.57% of construction companies brought insurance for labourers and ten (10) or 71.43% of construction companies don't have insurance coverage for labourers or labourers are not insured. Table 4.18 shows the finding of study on construction sites that have insurance coverage for employees.

Table 4.18: Results of employees insurance coverage rates

No_	Insurance requirements	Frequency(by site)		Percentage (%)	
		Yes	No	Yes	No
2	Employees are insured or have insurance coverage	5	9	35.71	64.29
2.1	Labourer are insured or have insurance coverage	4	10	28.57	71.43

Source: survey data

Contractor required to insuring his employees according to general condition of contract (PPA/2011) on clause 40.2. According to HSE (2012) most employers are required by the law to insure against liability for injury or disease to their employees arising out of their employment. This insurance usually used to provides payment for the services and claims such as medical costs, disability benefits if employee either permanently or temporarily disabled, and in the event that death occurs surviving dependents can also receive death benefits though workers' compensation insurance. Basically employer required to take out insurance to cover the expense needed for medical service and for related compensation for employees through insurance. Insurance is very important in case of employer/contractor is not ready to cover such injury and illness expenses due financial scarcity or financial problem.

4.5.3 Employees Training

The respondents were asked whether health and safety training is given or not to employees before starting work or enters into an operational construction zone. As finding of study ten (10) or 71.42% of construction site will give induction training for employees. Respondents also asked some specific training requirements whether given or not for their employees. The respondents were asked to respond on three different statements on the content or specific topics of training that was given. First statement is: "Training includes requirements of relevant H&S rules, code of practice or technical standards that must be followed"; the result indicates eight (8) or 57.14% of construction site conform that their training program include this topic but six (6) or 42.28% of construction site not include this on their training program. The second statement is "Training includes Operation of hand & power tools, fall protection, proper use of ladder and scaffold, protection of struck-by, Electrocution, trips, etc."; the result shows that 6 (six) or 42.86% of construction site assured that they were gave training on this topic but eight(8) or 57.14% of construction site is not. The third statement is "Training includes Hazards, risks and control measures involved in carrying out the task"; the result shows that the result shows that six (6) or 42.86% of construction site assured that they were gave training on this topic but eight (8) or 57.14% of construction sites not. Table 4.19 indicates that the respondents response rate on training program of studied construction sites.

Table 4.19: Results of provisions of training for employees

No_	H&S training requirements	Frequency(by site)		Percentage (%)	
		Yes	No	Yes	No
3	H&S induction training is given to workers	10	4	71.42	28.58
3.1	Training includes requirements of relevant safety and health rules, code of practice or technical standards that must be followed	8	6	57.14	42.86
3.2	Training includes two or more of the following: safe operation of hand & power tools, fall protection, proper use of ladder and scaffold, protection of struck-by, Electrocution, trips, etc.	6	8	42.86	57.14

3.3	Training includes Hazards and risks control measures involved in carrying out the task	6	8	42.86	57.14
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Source: survey data, 2019

As per required by labour proclamation 377/03 on article 92 per article 2; employer obligated to instruct and notify employees about the concerning hazards of their respective occupations and the precautions necessary to avoid accident and injury to health. The proclamation don't put specific training requirements or topics of training will necessarily shall be given but according to ILO code of practice for construction (1992) on article 20 and particularly on section 20.5, OSHA (2015), Safe Work Australia (2014), Reese & Edison (2006), and (HSE, 2006) the safety training basical include the topics and issues found on table 4.20 and on literature. As result indicate that 71.42% assure that they are were give safety traing to their employer. This higher percentage that found by Tolera (2016); found that 100% of construction workers do not take safety training.

4.5.4 Safety Officer

Respondent were asked whether their site/project have or assign health and safety officer or not; the result of study shows that four (4) or 28.57% construction site have or assign safety officer for the project but ten (10) or 71.43% of construction site didn't have or assign safety officer/manager. Table 4.20 indicates the results of the number of construction site that have & assign safety officer and not have & assign safety officer.

Table 4.20: Results of appointment of safety officer to the construction sites

No_	Requirement of appointing H&S officer	Frequency		Percentage	
		Yes	No	Yes	No
4	Safety officer is assigned for the construction site?	4	10	28.57	71.43

Source: survey data, 2019

Ensuring safety on construction sites is a corporate role of all stakeholders in construction projects. However each individual has their own specific roles in ensuring safety of workers. Among the stakeholders construction Safety officer specifically has responsibilities to creating and implementing safety measures and in general to create safe working environment

for construction workers. On labour Ethiopian proclamation 377/03 on article 92 on sub article 2; employer required to assign safety officer. From study it was found that only four (4) or 28.57% construction sites have or assign safety officer. The finding of this study is better in number than that of found by Lucy, *et al.*,(2016); found that 92.4% construction project do not have safety and health administration staffs and only 1.52% have safety manager.

4.5.5 Safety Committee

The respondents were asked whether health and safety committee available or established on project/site or not. Study result shows that three (3) or 21.43% of construction site/project establish or have H&S committee the remaining eleven (11) or 78.57% of construction didn't establish or have H&S committee. Also the respondent asked on statement "is there labourer representative on members of health & safety committee?"; the result show that from the three site who establish H&S committee no one included laborer representative on the committee. Table 4.21 shows the number of construction site that established H&S committee and included labourer representative on committee and that not.

Table 4.21: Results of health and safety committee establishment on site

No_	Requirements of establishing H&S committee	Frequency(by site)		Percentage (%)	
		Yes	No	Yes	No
5	Health & safety established committee	3	11	21.43	78.57
5.1	There is labourer representative on health & safety committee	0	14	0	100

Source: survey data, 2019

Employer is required to establish health and safety committee on labour proclamation 377/03 on article 92 on sub-article 2. Health and safety committee play important role to promote health and safety in workplace with cooperation of workers and employer. The finding of study shows that 3 construction sites have or establish health and safety committee but none of them include employee's representative in the committee. Health and safety committee required to including employees representative on the committee.

4.5.6 Personal Protective Equipment

The respondents were asked to respond whether they are provides PPE to employees or not and results of indicate that all construction site provided PPE to their employees. As specific the provisions of helmet, safety shoes, hand glove and safety belts were asked. According to result of study all fourteen (14) or 100% of construction sites provides helmets, nine (9) or 64.28% sites provides safety shoes, twelve (12) or 85.71% of construction sites provides hand glove and eight (8) or 57.14% of construction sites provides safety belts. Table 4.22 shows the results of PPE provisions on studied construction sites.

Table 4.22: Results of PPE provisions

No_	Requirements of PPE	Frequency(by site)		Percentage (%)	
		Yes	No	Yes	No
6	PPE provided	14	0	100	0
6.1	Helmet provided	14	0	100	0
6.2	Safety shoe provided	9	5	64.28	35.72
6.3	Hand Glove provided	12	2	85.71	14.29
6.4	Safety belt provided	8	6	57.14	42.86

Source: survey data, 2019

Construction is one the most risky industries for workers safety. To ensure safety on project sites construction workers must be equipped with proper personal protective equipment. PPE is intended to minimize exposure to various risks and potential hazards and it is the first line of defense for construction worker safety. When adequate PPE is not available the risky of accident on worker become higher. On labour proclamation 377/03 on article 92 on sub-article 3, Employer required to provide proper PPE and to instruct how to use it. The study found that from the survey construction sites more or less provide PPE at a different level as show on table 4.22.

4.5.6.1 Quantity in Percentage Helmet and Safety Shoe Provided or Available on site

Respondent were asked how much enough number of helmet they have/provided or available with respect to the number of employees that should have to necessarily wore helmet during working time specifically in the area there is risk of struck by falling object or any other matter that causes accident on the head is present or likely to be present. Also respondents were asked how much enough number of safety shoe they have/provided or available with respect to number of employees that should have to wore safety shoe during working time especially for worker who working at place there is risk of injuries on foot are present or likely to be present.

According to the result of survey data; by average number of helmet provided for employees from required number is only enough for 59.64% of employees. The same as that the analyzed data from nine (9) sites that provides safety shoe for employees indicate that the number of safety shoe provided or available for employees is only enough for 22.77% of employees. From interviews the study found that safety shoe mostly provided for professionals and permanent workers and provisions of safety shoe for labourers is rare. Table 4.23 indicates the number of helmet and safety shoes provided for employees.

Table 4.23: Quantity of helmet and safety shoe provided or available on sites in percentage with respect to number of employees

Construction Sites/projects	Helmet available	Safety shoe available
Site 1	50%	-
Site 2	70%	15%
Site 3	15%	<10%
Site 4	70%	<10%
Site 5	<10%	-
Site 6	100%	<10%
Site 7	50%	15%
Site 8	70%	70%
Site 9	100%	50%

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Site 10	<10%	-
Site 11	70%	15%
Site 12	50%	-
Site 13	100%	-
Site 14	70%	<10%
Average	59.64%	22.77%

Source: survey data, 2019

The above quantity of PPE provided is greater than that of the study was found by Tolera (2016); it is found that 96.8% of employees unable to use PPE because they were unable to get protective devices from the organization.

4.5.7 Registration and Reporting of Employments Accident

The respondents were asked whether they are register or record employment accident or not and also asked record of employment accident available or not. Study found that seven (7) or 50% of construction sites are registering employment accident and records of employment accident are available on sites. The respondents were asked during interview session to whom they are report the incident to and all respondents revealed that they will report to head office of Construction Company. The study conform that from Department industry peace of AABOLSA employments accident and diseases didn't reported to their office and there is no such kind of culture in between contractors and labour office. Table 4.24 shows that results of registration and record availability on studied construction site:

Table 4.24: Results of registration of employment accident

No_	Requirements of registering employment accident	Frequency		Percentage	
		Yes	No	Yes	No
7	Register employment accident	7	7	50	50
7.1	Recorded is available on site	7	7	50	50

Source: survey data, 2019

As stated on labor proclamation of Ethiopia 377/03 on article 92 on sub article 4 and on clause 45.7 of PPA contract; employer/contractor is required to record and report employment

accidents. The study found seven (7) or 50% of construction site record employments accident and diseases were happened on site. California Department of Industrial Relations (2005) says that the data of previous injuries and illness should be recorded to use it as bases for preparing better safety plan or program. This helps to not will do or repeat the same mistakes in the future. Another one is reporting work-related accident to concerned authorities is important to have reliable statistical data or rate on deaths, injuries, ill health and accidental loss. Having this kind of data is important to law enforcing body and health and safety policy maker.

4.6 Total Summary Score (Compliance Level) of OH&S Regulation of studied Construction Sites

As presented before on above section from 4.5.1 up to 4.5.7: fourteen (14) construction sites are evaluated out of total twenty one requirements(seven general requirements and fourteen sub-specific requirement) as evaluation criteria. The evaluation system or technique used is similar with master builder South Africa (MBSA, 2015) auditing system used for auditing or measuring level of compliance of OH&S for building construction industry. In MBSA auditing system each criteria or requirement will have one point. The analysis result of investigation shows that the average total point achieved by sites is 3.93 or 56.12% from general requirements and 7.42 or 53.06% from sub-specific requirements. Also results show that half of investigated sites score above 50% and half of score below 50%. The aggregate total average point achieved out of 21 is 11.35 or 54.06% and the standard deviation between total sites score is 5.96. Table 4.25 shows achieved points or level of compliance of each studied construction sites.

Table 4.25: Summary result of evaluations of studied construction sites

Con-sites	Point achieved from General requirement (out of 7)	Point achieved from specific requirement (out of 14)	Total Point achieved (out of 21)	Total point achieved in Percentage (Compliance level)
Site 1	2	3	5	23.81
Site 2	5	11	16	76.19
Site 3	3	6	9	42.86

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Site 4	2	3	5	23.81
Site 5	3	5	8	38.09
Site 6	7	13	20	95.05
Site 7	3	4	7	33.33
Site 8	4	10	14	66.67
Site 9	4	8	12	57.14
Site 10	1	1	2	9.52
Site 11	6	12	18	85.71
Site 12	3	4	7	33.33
Site 13	6	11	17	80.95
Site 14	6	13	19	90.48
Average	3.93	7.42	11.35	54.06

Source: survey data, 2019

In Ethiopia there is no standards and system of auditing OH&S compliance level for building construction sites. However when we see this average result of construction sites relatively with the MBSA it is under minimum acceptable standard; by MBSA standard any sites achieve less than 90% is unacceptable compliance level. The MBSA classifies achieved compliance level into: >95% (Comply with regulations), 90% - 95% (Acceptable but needs attention in the near future) and <90% (Unacceptable standards, needs urgent attention) (Windapo & Oladapo, 2012).

4.7 Factors affecting compliance with occupational health and safety regulation

The third research objective is aimed at identifying factors affecting compliance with OH&S regulations and other recommended safety practice for building construction project. The study specifically wants to identify factors affecting compliance with OH&S requirements in public building construction projects in Addis Ababa. Here is eleven (11) factors are adopted from literatures and provided to the respondents to put their level of agreement depend on the influence of each factors for non-compliance of OH&S regulation.

The respondents were asked to grade their level of agreement on given statement or factors for low implementation or non-compliance of H&S requirements. The respondent graded the

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statement using five level likert scale in the following ways: (5) strongly agree, (4) Agree, (3) Neutral, (2) Disagree, (1) strongly disagree.

Accordingly the factors that affect compliance with OH&S regulation are identified by the study. The analyses result from excel indicates RII of the given factors and their rank are showed on table 4.26 as below.

Table 4.26: Factor affecting OH&S compliance, RII and rank

No_	Factors affecting compliance with OH&S requirements	RII	Rank
1	Lack of commitment and negligent attitude of contractor's management to OH&S	0.86	1
2	Lack of strict enforcement of legislation by competent authority or officers	0.84	2
3	Less severe penalties for noncompliance	0.83	3
4	Limitations in the present OH&S legislation (in terms of interpreting and applying the legislation)	0.79	4
5	Lack of contractors management awareness and understanding towards OH&S rules and requirements	0.77	5
6	Minimal impact of the government in managing and regulating OH&S	0.76	6
7	Lack of Knowledge and Training of workers	0.75	7
8	Cost of compliance (Fund/capital)	0.72	8
9	lack of OH&S legislation for construction industry	0.71	9
10	Workers' attitude towards the practices OH&S (workers are not positive and adaptable)	0.7	10
11	Lack skilled and competent personnel for occupational health services	0.68	11

Source: survey data, 2019

As per each factor RII value and ranks the details of top three factors analyses result are presented and discussed as follows on section below.

4.7.1 Lack of commitment and negligent attitude of contractor’s management to OH&S

As shown on table 4.27 above; lack of commitment and negligent attitude of contractor’s management to OH&S is first leading factor from above listed on table 4.27 with RII value 0.86. As seen from respondents’ perceptions most of them 62.8% are strongly agreed and 22.86% are agreed on the influence of this factor on OHS regulation compliance. The results indicate that most respondent felt that Lack of commitment and negligent attitude of contractor’s management to OH&S highly affect compliance with OH&S regulations. Table 4.27 shows level of respondents agreement on influence of ‘‘Lack of commitment and negligent attitude of contractor’s management to OH&S’’ to compliance with OH&S regulations.

Table 4.27: Respondents level of agreement on Lack of commitment and negligent attitude of contractor’s management to OH&S

Level of agreement	Frequency	Percentage (%)
Strongly agree	22	62.8
Agree	8	22.86
Neutral	1	2.86
disagree	2	5.71
Strongly disagree	2	5.71
Total	35	100

Source survey data: 2019

Various authors in the literature noted that commitment and attitude of management affect highly compliance and non-compliance of OH&S regulations. The major decision including health and safety issue is made by management of contractors and if management is not committed and ignorant for safety issue it is not easy possible to comply with OH&S regulation. This is because of compliance with OH&S regulation is require additional financial-cost and this is perceived by contractors as burden and so if the management motive is profit maximization rather than safety of employees and compliance with regulation it will highly influence or affect compliance of safety regulations. Bayram (2018) said that the commitment of management expressed by the extent of top management of an organization prioritize occupational safety during the decision-making process and amount of resource

allocated for it. Windapo & Oladapo (2012) and Othman (2012) are discussed that management commitment and attitude to highly influence compliance of OH&S regulation. Therefore this study conforms the findings on the literature.

4.7.3 Lack of strict enforcement of legislation by competent authority or officers

The results of studies show that lack of strict enforcement of legislation by competent authority or officer ranked at second with RII value 0.84. The results found from survey data indicate that 51.43% of respondents strongly agreed and 28.57% of respondents agreed on lack of strict enforcement of legislation by competent authority or officers influence compliance with OH&S legislation. The remaining respondents felt neutral and disagree on lack of strict enforcement of legislation influence compliance of OH&S. Table 4.28 shows the level of respondents' agreement on the influence of "Lack of strict enforcement of legislation by competent authority or officers" to compliance with OH&S regulations.

Table 4.28: Respondents' level of agreement on lack of strict enforcement of legislation by competent authority or officers

Level of agreement	Frequency	Percentage
Strongly agree	18	51.43
Agree	10	28.57
Neutral	3	8.57
disagree	4	11.43
Strongly disagree	0	0
Total	35	100

Source: survey data, 2019

It is obvious that lack of proper enforcement of health and safety regulations often permits non-compliance which consequently contributes to a poor state of occupational health and safety. Besides the questionnaires analysis results; all most all interviewed respondents from construction sites confirmed that there is no enforcement of safety and health regulation by authority and said that each and every safety measure taken and facilities provided on sites were by free will or interest of contractor and contractor not requested by authority for safety compliance and also no strict measure is taken by authority against anyone who breaches

conformance to the regulations. Idubor & Oisamoje (2013) says that it is all well and good to make laws, those laws are useless if they are not complied with, and they cannot be enforced. According to Nzube & Lawrence (2012) and Othman (2012) low level of inspection and lack of supervision to enforcement of OH&S regulation causes noncompliance.

4.7.2 Less severe penalties for noncompliance

Study discovered that from 11 factors listed above on table 4.27 ‘‘Less severe penalties for noncompliance’’ are the thirdly ranked influencing factor for non-compliance of OH&S regulations with RII value 0.83. From study it was evidenced that 42.86% and 31.43% of the respondent are on strongly agreed and agreed respectively on this factor. Results indicate that there is no one disagrees on this factor. Table 4.29 shows level of respondents agreement on influence of ‘‘Less severe penalties for noncompliance’’ to compliance with OH&S regulations.

Table 4.29: Respondents level of agreement on less severe penalties for noncompliance

Level of agreement	Frequency	Percentage
Strongly agree	15	42.86%
Agree	11	31.43
Neutral	9	25.71
disagree	0	0
Strongly disagree	0	0
Total	35	100

Source survey data; 2019

The finding on the literatures Okojie (2010) and Adrison (2008) indicates inadequate penalty for offender or noncompliance of safety regulation doesn’t guaranty compliance. When we see labour proclamation 377/2003 on article 184 and 185 fix the amount penalty in Ethiopian birr for employer who violates and fail to fulfill the safety obligation under the proclamation. According to the proclamation the following is offence and have penalty of liability to fine not exceeding birr 1200 (one thousand and two hundred). (1) employer who fail to take all the necessary occupational safety and health measures and no to abide by the standard and directives to be given by the appropriate authorities according to article 12 sub-article 4, (2)

employer who require any worker to execute any work which is hazardous to his life according to article 14 sub-article 1 (e), and (3) employer who violates regulations and directives issued in accordance with this Proclamation relating to the safety of workers and commit and act which expose the life and health of a worker to a serious danger or does not give special protection to women workers and young workers' as provided for in Labour Proclamation according to article 185 sub-article 1. This amount of penalty for violations or for who fail to fulfill the specified safety requirements on the proclamation doesn't harsh the offender (in the case employer or contractor). The implication is that in order to ensure compliance shall increase the amount of penalties for noncompliance.

CHAPTER FIVE

CONCLUSION AND RECOMMENDATION

5.1 Conclusions

For the above analysis and for summary of the study it is concluded that:

The construction site management or contractor personnel's haven't awareness problem on the benefits of health and safety regulation requirements on enhancing health and safety of employees because majority (91%) of the them agreed that the health and safety requirement on contract and proclamation have positive impact in maintaining safety of employees also majority (85%) of them know that contractor have an obligation to comply with occupational health and safety regulation requirements selected for the study.

The practice and implementations of health and safety requirement is highly varied among the investigated construction sites with standard deviation 5.96 of total score and it is also observed that there high difference in safety preparation one construction site to another and only few construction sites give priority to safety issues. Only half of investigated sites achieve half (50%) compliance level and above H&S requirements stated on contract and proclamation specifically the requirements adopted on the study. contractors should comply with basic OH&S regulations. Complying with OH&S requirements and take care of employees is not a matter of willingness but it is the right thing for contractors to do it legally, contractually and morally whether if forced by the authority to do or not.

Lack of commitment and negligent attitude of contractor's management, lack of strict enforcement of OH&S regulation by authority and less severe penalty for noncompliance or violations of OH&S regulations are the major factors influencing contractor's to complying with OH&S regulations in public building construction projects in Addis Ababa.

5.2 Recommendations

The following recommendation should be put into consideration:

- Construction site management should influence head office management to provide safety equipment, facilities and to take any necessary steps to safeguarding

employees' life by notifying health and safety benefits of complying such requirements on regulations and obligation to do so as a contractor.

- Compliance with OH&S regulation and safeguarding employees H&S is legal & contractual requirements and obligation for employer/contractor. Therefore contractor should be recommended to provide PPE, safety training, first aid facilities and to appoint safety officer, to establishing health & safety committee, to register and report employment accidents and comply with other regulation requirements and recommended safety practice for construction industry
- Regulating agencies e.g. ministry of labour and social affair regional and city bureau of labour and social affairs should visit and inspect building construction sites compliance with existing OH&S regulations. The agencies must enforce regulation on construction sites & strictly follow up its' implementation and take corrective legal and administrative action when found violations of the regulation.
- There should be standards for auditing or evaluating of building construction site health and safety regulations compliance. Therefore ministry of construction, ministry of labour and social affairs and other concerned body should consider preparation of standards to audit building construction site health and safety compliance.

5.3 Recommendations for Further Research

- Comparatively and independently future studies should consider study in depth on cost of injuries and cost of health and safety compliance.
- Further research can consider determining level of compliance of building construction sites by encompassing in wider private and public building construction sites and including more other contractual and legal OH&S regulations requirements.
- Further study may consider on factors affecting enforcement of OH&S regulation by authority on building construction projects.

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APPENDIX

JIMMA INSTITUTE OF TECHNOLOGY

FACULTY OF CIVIL AND ENVIRONMENTAL ENGINEERING

CONSTRUCTION ENGINEERING AND MANAGEMENT DEPARTMENT

MSc thesis on Contractual and Legal Occupational Health & Safety Regulations Compliance
on Public Building Construction Project in Addis Ababa

Dear Sir/ madam,

Regarding: Academic Research Project for a Master's Degree Programme

I am a student at Jimma University Institute of technology(JIT) pursuing a MSc degree course
in construction engineering and management. It is a requirement that I conduct and submit a
research report on '**contractual and legal occupational health and safety regulations
practice in public building construction project: in case of Addis Ababa**'.

Please note that information you give is to be used in this study for academic purposes only,
and as such it will be treated with utmost confidentiality.

Your corporation and honesty in filling this questionnaire will be greatly appreciated.

Thank you for your time.

Yours Faithfully,

Fitsum Tadesse

Phone No_ 0910809377

Email tadelto@gmail.com

August 2019

APPENDIX A: QUESTIONNAIRES FOR PARTICIPANTS

The aim of this questionnaire is to study the Contractual and Legal Health and Safety Regulations practice in public building construction project in Addis Ababa. All data included in this questionnaire will be used only for academic research. This questionnaire is required to be filled with exact relevant facts as much as possible.

Part I. General information

1. Name of the Company: _____
2. Category: General contractors Building contractor
3. Project: _____
4. Number employees including staffs of project:
Less than 25 26-50 51-100 101-150 151-200
201-250 251-300 Greater than 300
5. Please specify what most represents your organization
Contractor consultant client If other please specify _____
6. What is your highest level of education?
Certificate holder Diploma Holder Higher Diploma Holder Bachelor
Degree Master's Degree Holder PhD Holder
7. What is your position in construction?
Safety & Health Manager Site engineer Project manager Supervisor
engineer Contract administer Human Resource manager Facility
manager If other please specify _____
8. Your experience relating to building construction project
Less than 5 5-10 11-15 16-20
9. Number of projects executed in the last five years: less than 5 5-10
more than 10
10. What's the value of projects executed in the last five years (in birr, million)
Less than 20 20-50 51-100 Greater than 100
11. Categories of your firm in construction business

Governmental Private if other please specify_____

Part II. Opinion of Respondents on Health and Safety Regulation Requirements

On last two column at right side of table Please add (√) as appropriate according to the question

No_		Yes	No
1	Do you think that providing first aid service important in preserving the H&S of employees?		
1.1	Do you think that contractor has obligation to provide first-aid facility on site construction site?		
2	Do you think that takeout insurance for employees are important for contractor?		
2.1	Do you think that contractors has obligation to takeout insurance or insuring employees?		
3	Do think that providing training for workers on health and safety issue reduce risk of injuries and diseases?		
3.1	Do you think that contractor has obligation to provide training for workers?		
4	Do you think that appointing safety officer helpful in reducing accident rate and to ensure safety of employees?		
4.1	Do you that contractor has obligation to appoint or recruit safety officer for construction site?		
5	Do you think that establishing health & safety department/committee improves health & safety of worker?		
5.1	Do you think that contractor has obligation to establish health and safety committee?		
6	Do think that PPE helps to improve health and safety of employees?		
6.1	Do you think that contractor has obligation to provide PPE by him/her cost?		
7	Do think that register/record and report employment accident is important?		

7.1	Do you think that contractor has obligation to register and report employment accident and disease?		
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Part III. Occupational Health and Safety Regulation Compliance in Construction Site

The following table consist questions developed based on general condition of contract of public procurement agency of Ethiopia (2011), labour proclamation of Ethiopia 377/2003 and other international code of practice for health and safety of employees. Based on your construction site practice and experience please answer the question appropriately.

Note I: 1. On last two column at right side of table Please add (√) as appropriate according to the question.

2. For the questions that is blackened on right side of last column; there is multiple choice under the questions and space provided. Please add(√) for the question with multiple choice and for the question with blanked space write your opinion/answer on the space provided.

Note II: The word “Employees” on the questionnaire denote whole construction site worker and especially labourer

Items		Yes	No
1. FIRST AID			
1	First aid service available on construction site		
1.1	First aid boxes (KIT) available at workplace		
1.2	Room or place to provide first aid service available on site		
1.3	Qualified/certified nurse or trained first aider appointed for first aid service on site		
1.4	First aid items properly maintained in a serviceable condition and in sufficient supply		
2. INSURANCE			
2.1	Does employees are insured or have insurance coverage?		
2.4	Does labourer are insured or have insurance coverage?		
3. TRAINING			
3	H&S induction training is given to workers		

Assessment of Contractual and Legal Occupational Health & Safety Regulations Compliance
on Public Building Construction Project in Addis Ababa

3.1	Training includes requirements of relevant safety and health rules, code of practice or technical standards that must be followed		
3.2	Training includes one or more of the following: safe operation of hand & power tools, fall protection, proper use of ladder and scaffold, protection of struck-by, Electrocution, trips, etc.		
3.3	Training includes Hazards and risks control measures involved in carrying out the task		
4. HEALTH OFFICER			
4.1	Is there safety officer/manager for the construction site?		
5. HEALTH AND SAFETY COMMITTEE			
5.1	Is there health & safety committee?		
5.2	Is there labourers representative on members of committee?		
6. PERSONAL PROTECTIVE EQUIPMENT			
6.1	Is there Hard hats provided for employees?		
6.2	To how many percent in average a sufficient enough number of hard hats do you have or available for employees?(<i>number of hard hats to employees ratio</i>) For less than10% enough[<input type="checkbox"/>] 10-20% enough[<input type="checkbox"/>] 21-40%enough [<input type="checkbox"/>] 41-60%enough [<input type="checkbox"/>] 61-80% enough [<input type="checkbox"/>] 100% enough [<input type="checkbox"/>]		
6.4	Is there Footwear provided to your employees?		
	If question 6.4 is yes, To how many percent in average sufficient enough numbers of footwear(safety shoes) do you have or available for employees? <i>?(number of safety shoes to employees ratio)</i> <10% enough [<input type="checkbox"/>] 10-20% enough [<input type="checkbox"/>] 21-40% enough [<input type="checkbox"/>] 41-60% enough [<input type="checkbox"/>]] for 61-80% enough [<input type="checkbox"/>] 100% enough [<input type="checkbox"/>]		
6.7	Is there Gloves provided to your employees?		
6.9	Is there Safety harnesses system or safety belts available?		
7. REGISTER AND REPORT EMPLOYMENT ACCIDENTS AND DISEASES			
7.1	Do you register/record employments accidents and diseases?		
7.2	If question number 7.1 is yes, Is there employment accident record is available?		
7.3	To whom you will report the incident/accidents? _____		

Part III. Factors Affecting Complying With Requirements of Health and Safety Regulations

Below there are numbers of factors influencing complying with health and safety requirements stipulated on legislation, contract document and other nationally and internationally recommended code of practice. As your experience on the field and observation Please express your opinion on the importance of the following factors as key factors for low implementation or non-compliance of health and safety regulations on public building construction projects.

To measure the degree of impact for low implementation or non-compliance with safety and health regulations; the degree of impact is constructed on a five-point Likert scale. (Please tick the appropriate box). Use a scale of 1-5. **Where 5 = I strongly agree, 4 = I agree, 3 = Neutral, 2 = I disagree and 1 = I strongly disagree.**

S.N	Factor affecting complying with Health & Safety regulations	5	4	3	2	1
1	Limitations in the present OH&S legislation (in terms of interpreting and applying the legislation)					
2	Cost of compliance (Fund/capital to provide enough adequate safety facilities such PPE and to recruit Safety expert)					
3	lack of Occupational Safety and Health legislation for construction industry					
4	Lack of Management Awareness and understanding towards Occupational safe and health rules and requirements					
5	Lack of commitment and negligent attitude of contractor's management to occupational safety and health					
6	Lack skilled and competent personnel for occupational health services					
7	Less severe penalties for noncompliance					
8	Lack of Knowledge and Training of workers					
9	Workers' attitude towards the practices of occupational health & safety (workers are not positive and adaptable)					
10	Lack of strict enforcement of legislation by competent authority or officers					

12	minimal impact of the government in managing and regulating occupational health and safety					
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APPENDIX B: INTERVIEW GUIDIE FOR KEY INFORMANTS

1. Is first aid service available on site? How do you do when accidents will occur on worker on site?
2. Explain how do you pay or cover medical expense and compensation for injured employees. Does the company have insurance coverage for employees?
3. Do you provide safety training for employees? If yes on what topics/issues do you train them?
4. Is there sufficient enough PPE available; how much enough do you have?
5. Is there safety officer assigned and safety committee is established?
6. Do you register/record accident case; is there record available on site? Do you report the cases of accident on site to labour inspectors?
7. What are the factors influencing to take any necessary safety measures and to provide the right kind PPE and in sufficient amount?

Thank you for your Response!!

APPENDIX C: OBSERVATION CHECKLIST

No-	Items	Yes	No
1	Site worker wore :		
	Helmet		
	Safety shoes		
	Reflective cloth		
	Hand glove (worker work with wet concrete)		
2	Guard rail is provided for worker working on the height and scaffolds		
3	Safety sign or poster available on site		
4	Site is clear and free from debris		

Assessment of Contractual and Legal Occupational Health & Safety Regulations Compliance
on Public Building Construction Project in Addis Ababa

APPENDIX D: SCHEDULE OF ANALYSIS

Appendix D1: Compliance level calculation

Code of items	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	S13	S14	Total
1	1	1	0	1	1	1	1	1	1	0	1	1	1	1	12
1.1	1	1	0	1	1	1	1	1	1	0	1	1	1	1	12
1.2	0	1	0	0	0	1	0	1	0	0	1	0	1	1	6
1.3	0	0	0	0	0	1	0	1	0	0	1	0	1	1	5
1.4	0	1	0	0	0	1	0	1	1	0	1	0	1	1	7
2	0	1	0	0	0	1	0	1	0	0	1	0	0	1	5
2.1	0	0	0	0	0	1	0	1	0	0	1	0	0	1	4
3	0	1	1	0	1	1	1	0	1	0	1	1	1	1	10
3.1	0	1	0	0	1	1	0	0	1	0	1	1	1	1	8
3.2	0	1	0	0	0	1	0	0	1	0	1	0	1	1	6
3.3	0	1	1	0	0	1	0	0	1	0	0	0	1	1	6
4	0	0	0	0	0	1	0	0	0	0	1	0	1	1	4
5	0	0	0	0	0	1	0	0	1	0	0	0	1	0	3
5.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	1	1	1	1	1	1	1	1	1	1	1	1	1	1	14
6.1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	14
6.2	0	1	1	1	0	1	1	1	1	0	1	0	0	1	9
6.3	1	1	1	0	1	1	1	1	1	0	1	1	1	1	12
6.4	0	1	1	0	1	1	0	1	0	0	1	0	1	1	8
7	0	1	1	0	0	1	0	1	0	0	1	0	1	1	7
7.1	0	1	1	0	0	1	0	1	0	0	1	0	1	1	7
Total score	5	16	9	5	8	20	7	14	12	2	18	7	17	19	
Compliance level in % age	23.8	76.2	42.8	23.8	38.1	95.2	33.3	66.7	57.1	9.5	85.7	33.33	80.9	90.5	

Assessment of Contractual and Legal Occupational Health & Safety Regulations Compliance
on Public Building Construction Project in Addis Ababa

Appendix D2: RII Calculation

Factors affect compliance with OH&S		Strongly agree	Agree	Neutral	Disagree	Strongly disagree	RII	Rank
Limitations in the present OH&S legislation	Frequency	7	20	7	1	0	0.79	4
	Percentage	20%	57.14%	20%	2.86%	0		
Cost of compliance (Fund/capital)	Frequency	9	13	5	7	1	0.72	8
	Percentage	25.71%	37.14%	14.28%	20%	2.86%		
lack of OH&S legislation for construction industry	Frequency	7	16	5	3	4	0.71	9
	Percentage	20%	45.71%	14.28%	8.57%	11.43%		
Lack of Management Awareness and understanding towards OH&S rules and requirements	Frequency	10	17	3	3	2	0.77	5
	Percentage	28.57%	48.57%	8.57%	8.57%	5.71%		
Lack of commitment and negligent attitude of contractor's management to OH&S	Frequency	22	8	1	2	2	0.86	41
	Percentage	62.86%	22.86%	2.86%	5.71%	5.71%		
Lack skilled and competent personnel for occupational health services	Frequency	12	4	10	5	4	0.68	11
	Percentage	34.28%	11.43%	28.57%	14.28%	11.4%		
Less severity penalties for noncompliance	Frequency	15	11	9	0	0	0.83	3
	Percentage	42.86%	31.43%	25.71%	0	0		
Lack of Knowledge and Training of workers	Frequency	11	12	7	3	2	0.75	7
	Percentage	31.43%	34.28%	20%	8.57%	5.71%		
Workers' attitude towards the practices of OH&S	Frequency	7	11	11	5	1	0.7	10
	Percentage	20%	31.43%	31.43%	14.28%	2.86%		
Lack of strict enforcement of legislation by competent authority or officers	Frequency	18	10	3	4	0	0.84	2
	Percentage	51.43%	28.57%	8.57%	11.43%	0		
minimal impact of the government in managing and regulating OH&S	Frequency	12	12	6	2	3	0.76	6
	Percentage	34.28%	34.28%	17.14%	5.71%	8.57%		

Cronbach's alpha calculation

$$\alpha = \left(\frac{k}{k} - 1\right) * \left(1 - \left(\frac{\sum si^2}{st^2}\right)\right)$$

α = alpha

k = number of items(questions/statement)

si = variance of i^{th} item

st = variance of sum of score

$k = 11$

$\sum si^2 = 13.32081633$

$st^2 = 48.71346939$

$\alpha = 0.8$