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Sector-specific Labour Inspection Guide for Brick Industry

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skat Swiss Resource Centre and Consultancies for Development

RLRO

greenWise CONSULT LTD

ACKNOWLEDGEMENTS

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PROmoting Employment through Climate Responsive COnstruction

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1. Introduction

The clay brick industry is an old industry in Rwanda witnessing remarkable growth in recent years. This growth anticipates an increase in Made-in-Rwanda construction materials to support sustainable urbanization, economic development, and employment creation. The production of clay products, primarily bricks and tiles in Rwanda, involves multiple actors across the clay value chain, encompassing various steps in the production process starting from the stage of mining and exploration up to the end use of clay products. Clay products are produced and fired on site mostly situated in wetlands where raw material is. Extraction of clay and processing activities take place in the same area for the traditional brickyards but for the semi-industrial and industrial producers, the movement of raw materials and final products may cut across different locations. Though most existing clay operators are still at small-scale levels with hard working conditions, salaries are based mainly on piece-meal wage systems and traditional manual operating modalities. Further to this, there is continuous progress and an increasing move towards the industrialization of the sector, with the scaling up of the production units to either semi-automated or automated machines with permanent kilns, on which the sector-specific labour inspection guide focuses. However, as noted in the brick production industry, many micro-value chains coexist with large value chains as described in this document.

Based on the current Labour Inspection Checklist, it has been noted that there is a need for more sector-specific checklist indicators in the section concerning compliance with Health and Safety at Workplace and Hygiene for the Brickyards. This need arises due to the unique Occupational Hazards faced by Workers in the brick industry, which pose a threat to the health and safety of all workers in this sector. Therefore, the inclusion of the additional indicators will enhance the performance of the brickyards and increase productivity in Rwanda. The brick production flowchart is provided below to assist in the inspection of the brick yards.

2. Rational for the Guide

An analysis of the current checklist does show that there are some gaps in the section on compliance with Health and Safety at Workplace and Hygiene. The gaps are based on two critical elements:

a. The inspection checklist is intended for use by inspectors, but industry experience has shown that the brick production units need to have a good understanding of the key requirements that need to be covered in the inspection.

b. The peculiarity of the brick production sector requires the labour inspectors to be oriented in the sector through enhanced explanations of the key sector's OHS challenges as has been explained in this Sector-specific Labour Inspection Guide.

2.1 Objective of the Guide

The objective enhanced inspection checklist, therefore:

- Establishing a social dialogue framework where labor inspectors, brick producers, and workers can collaboratively understand and address their respective requirements to ensure the well-being and health of workers in the workplace.
- Focusing on creating a process where the labor inspectors, the brick producers, and their workers can work together as a result of the tripartite discussion on the improvement of labour inspection in the brick industry. This leads to an increase in the awareness of safety and compliance with the labor standards among employers in the brick industry and therefore leads to improved productivity in the industry.
- Offering more effective guidance to labor inspectors, employers, and workers.

2.2 Scope of the Sector-specific Labour Inspection Guide for the Brick Industry

The brickyard in this guide is defined as the production unit, which possesses the brick production infrastructure that is a permanent kiln and hangar as a minimum condition. On the other hand, brick manufacturers with non-permanent structures mainly cooperatives, although many operate in a fixed physical location, are given special consideration given the traditional brick industry being a labor-intensive and low-technology activity, as it remains a source of income generation for many seasonal workers as off-farm economic activities. Traditional brickmaking, like any informal industry, is highly competitive since barriers to entry are relatively low and thus needs enhanced OHS performance. The Sector-specific Labour Inspection Guide is focused on some of the specific activities that are related to the brick industry.

Based on this, the guide will target semi-industrial and industrial brick production. However, this does not fully exclude the traditional brick production units, inspection for which primarily focuses on child Labour. The use of the Guide for traditional brick production will assist in enhancing and promoting awareness of workers and workplace safety from the OSH perspective.

3. Occupational Hygiene in Brick Production Units: common hazards, risks, causes and their effects on workers' well-being

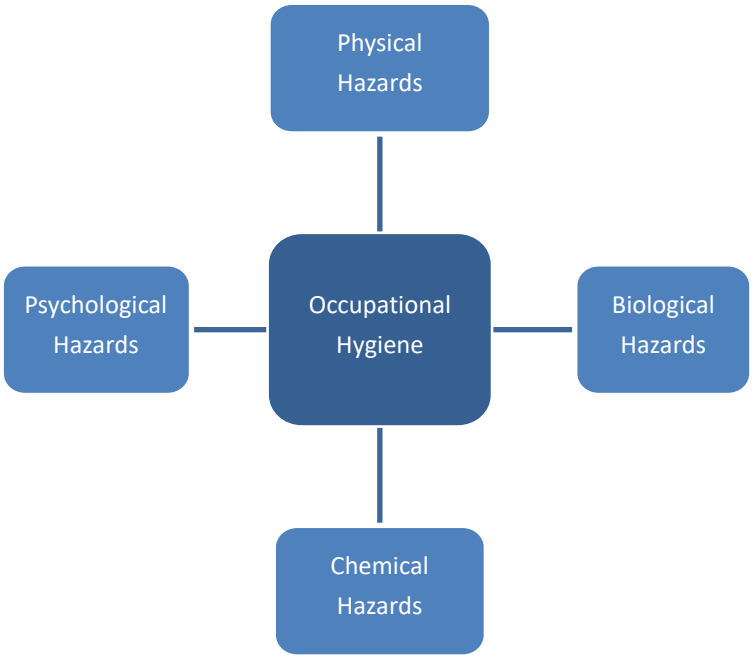
3.1 Definition of Occupational Health and Safety

Occupational Health and Safety is defined by the International Labour Organization (ILO) and World Health Organization (WHO), as "the promotion and maintenance of highest degree of physical, mental and social well-being of workers in all occupation".

3.2 Occupational Hygiene in Brickmaking

Occupational health and safety in brickmaking are ubiquitous with danger to general health. It impacts during the manual excavation of clay when massive loads of clay are being transported by head-bearing loads of both men and women while working in the open areas which may cause heat strokes and finally impacts from the heat and toxic smoke emanating from the biofuels used to fire the various kilns, from fumes which can be carcinogenic.

Occupational health hazards[1] in general and in the brickyards can be categorized as shown in the diagram:



[1] hazard is an agent, condition or activity with potential to cause harm that, if left uncontrolled, may adversely affect the well-being or health of exposed people. Simply defined it is ***Danger related to workplace***.

3.2.1 Physical Hazard:

Physical hazards are substances or activities that threaten the physical safety of workers, leading to physical harm. They are the most common and are present in most workplaces at one time or another. These include unsafe conditions that can cause injury, illness, and death. Physical hazards include exposure to slips, trips, falls, electricity, noise, vibration, radiation, heat, cold, and fire**.**

Type of Physical hazards:

- **Noise:** Noise is always a problem in any industry and the clay brick industry is no exception. The heavy-duty machines employed in the production of clay bricks are the Disintegrator / Roller Mills / Mixers/ Extruder and Cutter. All these machines do exhibit a high level of sound, above 65 dB going up to 90 dB, which in some machines is constant, and in some cases repetitive, can cause hearing loss problems in the long run.
- **Vibrations:** These are mechanical oscillations transmitted to the human body via direct contact. Vibration is transmitted into your hands and arms when using hand-held/operated tools and machinery. Heavy-duty machines also cause a lot of vibrations. Anyone working on such machines is likely to be afflicted with initial fatigue and this leads to musculoskeletal problems. Excessive exposure can affect the nerves, blood vessels, muscles, and joints of the hand, wrist, and arm.
- **Temperatures:** Both very cold and very hot temperatures can be dangerous to workers' health. In Rwanda, the temperature is relatively mild throughout the year, however, the workforce in the clay brick industry experiences intense heat during the dry season due to prolonged exposure to the sun, particularly, workers engaged in the manual extraction of clay. Constant exposure to heat leads to dehydration/acidity and heat stroke, and it can be fatal at times.
  Another instance is when workers are exposed to the high heat of the kiln. Most brickworks do not have a temperature measurement system, so the workers are forced to look at the naked flame in the kiln and assess the temperature status. Repeated observation of naked flame can cause acceleration of the onset of cataracts.
- **Illumination:** Poor lighting can affect the quality of work, specifically in situations where precision is required, and overall productivity. Poor illumination at the workplace is a constant worry for the workforce. It can lead to accidents, and also eye strain, which impairs vision. In many brickyards in Rwanda, production takes place under natural lighting. However, during the rainy season particularly, the lighting level notably diminishes and requires a backup lighting system.

Effects of Physical Hazards:

Exposure to these hazards can be short-term or long-term and can occur at work and in the community. The effects include Hypertension, Hyperacidity, Heat Stroke, Fatigue, Dermatological problems regarding the skin, Dehydration, Cataract, and Hearing Loss.

3.2.2 Chemical Hazard:

A chemical hazard is any substance, regardless of its form—that can potentially cause physical and health hazards to people or can result in harm to the environment. It can also be defined as the actual risk associated with specific chemicals. The harmful effect on a worker's health is from direct contact or exposure to the chemical, usually through inhalation, skin contact, or ingestion and swallowing. However, the most common way for chemicals to enter the body in the workplace is through inhalation of the following: Smoke, Gases, Vapors, Mists, Dust, and Fumes.

Type of Chemical hazards

Inorganic dust in the form of minute clay particles, and particulate matter, being ingested by the workers, leads to bronchitis, pneumonia, occupational asthma, and silicosis, and these conditions can get aggravated depending upon the severity of the exposure. The type of chemical exposure depends primarily on the type of fuel used to fire the kilns. Excessive dust, gas, and vapor exposure in the brick kilns can likewise lead to irreversible chronic diseases.

Brick dust particles contain known irritants and carcinogens that deteriorate the breathing capacity of the lungs. One of the carcinogenic chemicals contained in brick dust is crystalline silica. Organic dust comes from the dust particles of coffee husk/sawdust, which leads to breathlessness, cough, lung cancer, etc. Also, kiln fumes, which are laden with sulfurous gases cause heart palpitations, mucous membrane loss, and a host of other medical problems.

Effects of Chemical Hazards:

Chemicals like Barium Carbonate (added to clay to avoid the formation of efflorescence) can enter and irritate the nose, air passages, and lungs. They can become deposited in the airways or be absorbed by the lungs into the bloodstream. The blood can then carry these substances to the rest of the body.

Chemical exposure in brickyards and workplaces can cause various types of harm when adequate control measures are not implemented. Hazardous chemicals are substances that can cause adverse health effects such as poisoning, breathing problems, skin rashes, allergic reactions, allergic sensitization, cancer, and other health problems from exposure. The addition of such chemicals is restricted to large clay brick manufacturing companies, who have stringent quality standards to be met.

3.2.3 Psychological Hazard:

Psychological hazards are aspects of the work environment and the way that work is organized that are associated with mental disorders and/or physical injury or illness. When psychological hazards are not effectively managed, they can negatively impact organizational measures including productivity, absenteeism, and turnover. The psychosocial working environment is a collective term that covers the interaction between people in a workplace, the work of the individual and its impact on the employees, organizational conditions, and the culture of the organization.

The scheduled working duration is eight hours a day, of which one hour is reserved for lunch break. However, workers are exploited and made to work longer hours, as much as twelve hours, with marginal or no increase in monetary benefits. The extra working hours put an onerous burden on the individual's physical being.

Small brickworks in Rwanda are notorious for their operations as they are prone to various problems as highlighted below:

- Not providing any paid leave to their casual workforce. If they are absent for a day, they lose their wage for that day. In such a working condition, the worker is drawn to alcoholism, which becomes an addiction. Alcohol addiction leads to abusive behavior, anxiety, an aggressive nature, absenteeism, carelessness, and a disturbed family life.
- High work intensity especially during high season without required breaks. There are cases in which workers work for 7 days a week without rest.
- The repetitive nature of work leads to boredom, creating fatigue which in turn may lead to psychological effects.

Types of Psychological Hazards

Psychological hazards include the disorganized layout of the workplace, low reward and recognition, harmful behaviors, poor organizational change management, working hours, low job control, exploitation, unhealthy working conditions, poor physical work environment, and poor role clarity all of which are crucial in the brick industry.

Effects of Psychological Hazards

Exposure to psychological hazards and risk factors has been linked to long-term physical health issues. Furthermore, if not managed effectively, psychosocial hazards can impact workers' psychological and physical health and well-being. Psychological harm may include anxiety, depression, post-traumatic stress disorder, and sleep disorders, that trigger physical harm such as musculoskeletal injuries, chronic disease, or fatigue-related injuries. Psychological hazards are often related to work organization like poor communication, poor planning, no social interaction, etc., and very much preventable.

3.2.4 Ergonomic Hazard:

Ergonomics is the scientific study of human work conditions, especially the interaction between man and machine. An ergonomic hazard refers to any physical condition or physical, mental, and organizational factors found in the workplace that can cause injury or health concerns, both in the short and long term. It focuses on designing workstations, tools, and work tasks for safety, efficiency, and comfort. Ergonomics seeks to decrease fatigue and injuries, along with increasing comfort, productivity, job satisfaction, and safety, because work injuries are not inevitable, and a well-designed job should not hurt you. Ergonomics is important for workers because when they are performing a job, and their bodies are stressed by awkward postures, extreme temperatures, or repeated movements, their musculoskeletal system is affected. Workers may begin to have symptoms such as fatigue, discomfort, and pain, which can be the first signs of a musculoskeletal disorder.

In the brickyards physical activity of workers, more so of female workers consists of bending, pushing, pulling, carrying uphill, climbing, etc., due to repetitive action, causes a lot of strain, leading to medical issues of muscle fatigue, ligament tear, spinal disc dislocation, cervical pain etc. Further to the poor working posture, lifting freshly extruded bricks, carrying dried bricks to the kiln and stacking them, unloading fired bricks from the kiln, and transferring them to the finished goods yard, all without proper medical review, lead to chronic work-related musculoskeletal disorder, that cause muscle, tendon and nerve damage, leading to acute tendonitis, carpal tunnel syndrome, and neck stiffness.

Types of Ergonomic Hazard

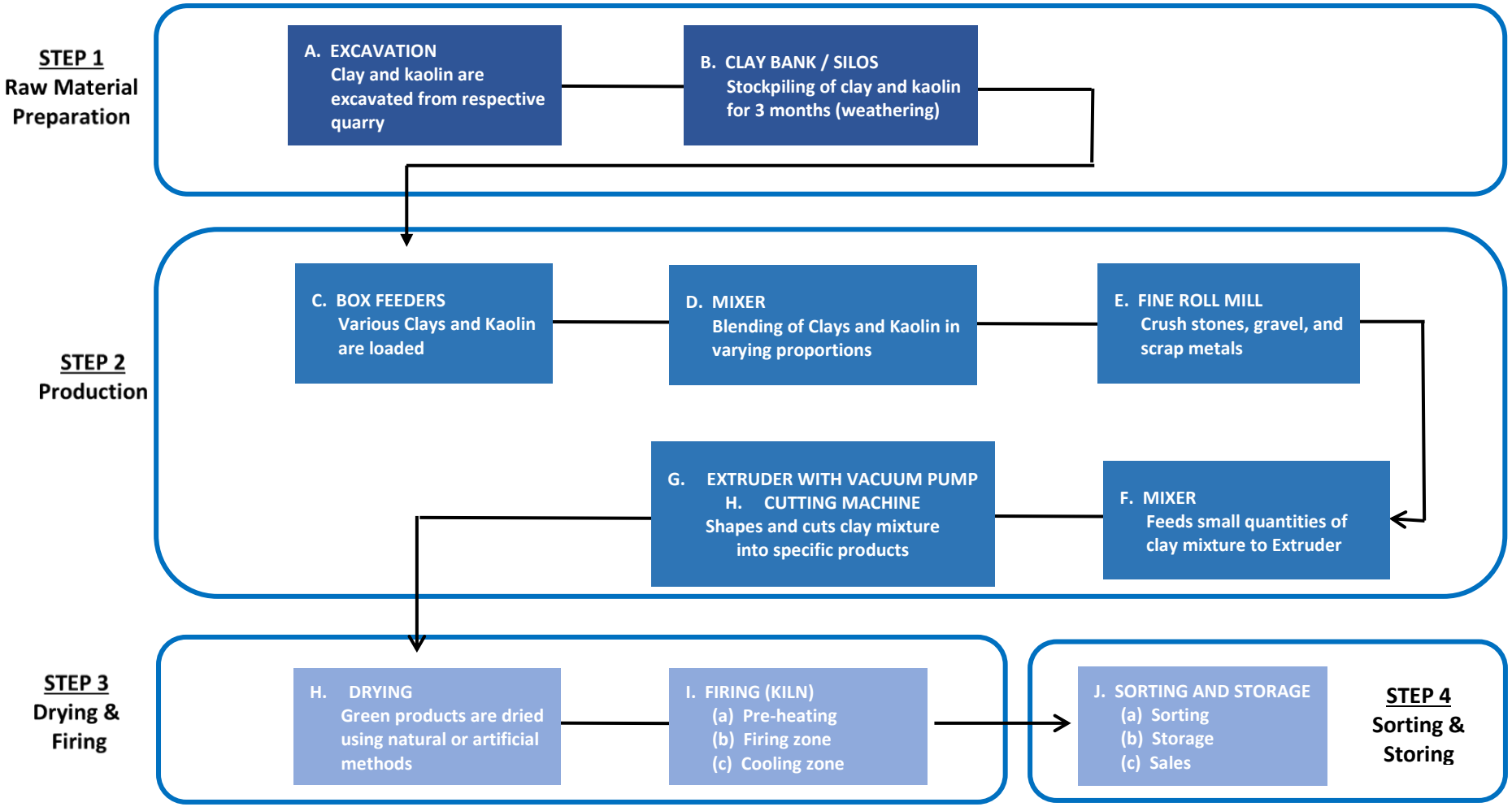
Creating a safe workplace requires an understanding of ergonomic hazards. Some of the ergonomic hazards in workplaces include poor posture, repetitive motion, material handling, injuries, heavy lifting, contact stress, extreme temperatures, poor lighting, excessive noise, slips, and falls due to inadequate workplace layout and surface condition.

Effects of Ergonomic Hazards

Musculoskeletal injuries are those that affect the muscles, tendons, ligaments, and spine and are some of the most common injuries. Musculoskeletal disorders or MSDs are cumulative and chronic injuries of the soft tissue muscles, tendons, ligaments, nerves, joints, and blood vessels. It is a fact that safe, injury-free, comfortable employees are happy employees.

4. Brick Production Workflow

4.1 Production Flow Chart



Source: SKAT, 2023

4.2 Common Hazards in each Production phase

	STEP 1: Preparation	STEP 2: Production	STEP 3: Drying and Firing	STEP 4: Sorting, Loading, and Unloading
Hazards	• Ergonomic • Physical • Biological • Chemical	• Ergonomic • Physical	• Physical • Chemical	• Ergonomic • Physical

5. Risk Assessment and Control Measures

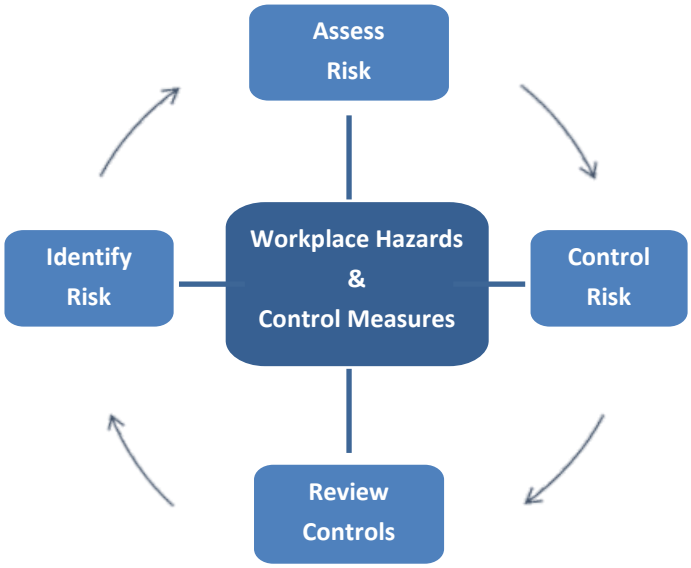
5.1 Risk Assessment

A risk is a combination of the likely severity and probability that somebody will be harmed by a specific hazard. Risk Assessment is a careful examination of what, in the workplace, could cause harm to people, enabling to determine whether sufficient precautions should be taken, or further measures put in place to mitigate risks. Risk assessment helps to estimate and evaluate all the risks associated with each hazard identified.

A risk assessment is an important step in protecting workers and businesses, as well as complying with the law. It helps business owners focus on the risks that matter in their workplace – the ones with the potential to cause harm. Risk assessment is a continuous process.

- IT IS NOT ABOUT: Stopping people from doing things, creating long, complex, and bureaucratic arrangements.
- IT IS ABOUT identifying ways of enabling people to do things safely and identifying practical steps to protect people from the risks that cause real harm and suffering.

The risk assessment procedures are explained as follows:



5.2 Types of risk assessments:

There are always signs of serious accidents and incidents before catastrophic incidents at medium or larger scale occur. The near-miss incident is often overlooked and little attention or no attention is paid. However, a near miss is a potential hazard and may lead to serious damage to workers and properties at brickyards. Therefore, it is important to identify near misses during risk assessment and proactively apply preventive measures.

Baseline risk assessments (Baseline HIRA): Purpose of a baseline risk assessment

The purpose of conducting a baseline Hazard Identification and Risk Analysis (HIRA) is to establish a risk profile or a set of risk profiles. It is used to prioritize action programs for issue-based risk assessments. The output of a baseline risk assessment is a risk profile or set of risk profiles; and a clear description of the methodology, system, terminology, etc. used in the scoping exercise, and what may be required for the improvement of the baseline HIRA in the future.

Issue-based risk assessments (Issue-based HIRA): The purpose of conducting an issue-based HIRA is to conduct a detailed assessment study that will result in the development of action plans for the treatment of significant risk. This type of assessment is normally focused on at operational activities, processes, and systems-based business functions. It focuses on the identification of the risks within a certain task, process, or activity and is usually associated with the management of change.

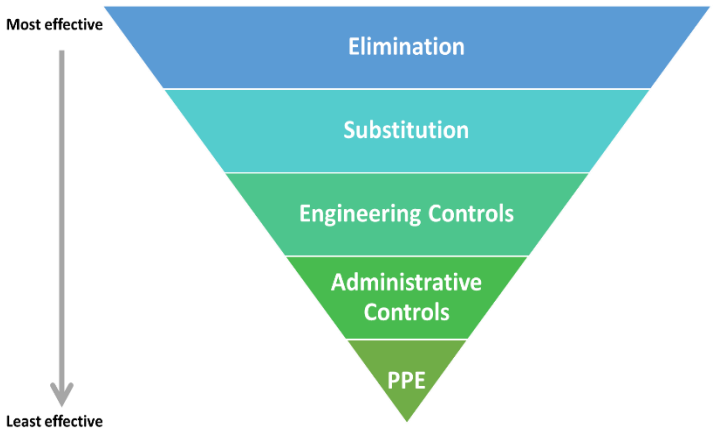
Continues risk assessments (Continues HIRA); A continuous risk assessment should be conducted continuously in the work environment. It is a powerful and important form of assessment and should take place continually, as an integral part of day-to-day management. In continuous HIRA, the emphasis is on day-to-day hazard awareness, through HIRA, and immediate risk treatment. The purpose of conducting continuous HIRA is to:

- Identifying hazards to treat significant risks immediately,
- Gathering information to feed back to issue-based HIRA,
- Gathering information to feed back to baseline HIRA

5.3 Hierarchy of Risk Control Measures

The rationale for this hierarchy of control is that, if the hazard is removed, a similar accident cannot occur; moreover, solutions that rely on elimination, substitution, and engineering controls are more dependable than those that rely on human action. It must be borne in mind that, whichever control measure is chosen, information, instruction, and training will be needed to ensure a reduction of the risks; the inspectors may also identify a need for training as a preventive measure. The hierarchy of risk control measures should be followed:

- **Elimination:** measures that eliminate risk, e.g., using safer products (water- rather than solvent-based paints).
- **Substitution:** e.g. replacing a machine currently in use with one that has a better guard or a less hazardous product.
- **Engineering controls:** measures that reduce the likelihood of exposure to the hazard, e.g. Modification of



equipment or the workspace, using protective barriers, installation of safety guards, and development of local exhaust ventilation.

- **Administrative controls:** measures that minimize the risk through safe systems of work, (e.g. rotation of workers to reduce exposure, reduction of repetitive activities through breaks, having documentation mechanisms to improve efficiency, having guided and safety signage, etc.).
- **Personal protective equipment:** This is the use of collective protective measures (e.g. overalls, safety boots, gloves, helmets, etc.) where they are identified according to the risk and are used by the workers.

5.4 Self-monitoring

To achieve internal issues the management team should continuously undertake

- Joint efforts of employers and employees
- Regular monitoring (periodical)
- Internal reporting channel and mechanism (i.e.: whistleblowing mechanism)
- Awareness raising
- Communications and reporting
  - Internal communication between employers and employees
  - External communication to the District, RLRO, inspectors, brick producers' association
- Rule of reporting: Non-disciplinary acts

6. Complementary Inspection Checklist for Brickyards

The Ministry of Public Service and Labour, through its dedicated labor inspectors, played a pivotal role in the meticulous development of this Guide. Within it, essential aspects and comprehensive guidelines are outlined, that are imperative to adhere to during Occupational Health and Safety inspections within brickyard establishments.

This Guide has been carefully crafted with the explicit aim of honing in the specific needs and challenges faced by the brick industry.

6.1 Enhanced Compliance on Health and Safety at Workplace and Hygiene

This annexed checklist serves as a valuable resource not only for our diligent labor inspectors but also for brickyard owners. By utilizing this tool, brickyard owners and managers will have the means to comprehensively assess their operations, identify areas for improvement, and subsequently enhance the overall safety and well-being of their workers.

Occupational Safety and Health Management System	**Instructions: Rate the following items from 0-5 whereby (0= Mediocre), (3= Acceptable), and (5= Excellent).** **In terms of percentage, for each rate, a factor of 20 % is applied.**								
21. What is the status of the Occupational Safety and Health management system? **NB: if YES (code as per numeration) if NO (code is zero)**	**Items**	**NA**	**0**	**1**	**2**	**3**	**4**	**5**	**%**
	1. OSH Committee available for Enterprise								
	2. The OHS committee is well informed about four hazards in brickyards								
	3. The firm undertakes risk assessments								
	4. Register for accident and injury recording available								
	5. Workers insured on occupational Hazards								
	6. Drinking water available for workers								
	7. Portable water available for all workers								
	8. Workers medical certificate available								
	Average percentage of compliance								
22. Does your establishment have the following materials? **NB: if YES (code as per numeration) if NO (code is zero)**	1. An overall Emergency Plan								
	2. Fire Extinguishers functioning								
	3. Visitor Emergency Guides								
	4. First Aid Facilities								
	5. First Aid team well trained								
	6. Washing facilities clean								
	7. OSH Posters and Information displayed								
	Emergency contact information								
	(Fire brigade, Ambulance, and police)								
	8. Personal Protective Equipment is correctly used:								
	9. Reserved store material								
	10. Toilets available clean and separated for men and women								
	11. Equipment Maintenance Plan for tools and machines available.								
	Average percentage of compliance								
24. Does the working environment have the following layouts? (observation by Labour Inspector) **NB: if YES (code as per numeration) if NO (code is zero)**	1. Well-designed production site layout which facilitates smooth operations								
	2. Adequate storage								
	3. Comfortable temperature								
	4. Adequate lighting								
	5. Odor free								
	6. Adequate ventilation								
	7. Is noise level acceptable/adequately controlled?								
	Average percentage of compliance								

Note: The average percentage of compliance results are categorized as follows:

Green = Achieved (70 % and above)	**Yellow = On target to be achieved (50 – 69 %)**	**Red = Not on target to be achieved (Below 49 %)**

7. Annex: 1

N°	Recommendations	Implementation Deadline
01		
02		
03		
04		
05		
06		
07		
08		
09		
10		

Date of inspection: ……../……./202	***Date of inspection: ……./……../202***
Name of the Respondent and his/her title:	***Name of Labour inspector:***
……..	***……***
……..	***……***
Signature:	***Signature:***

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