ASSESS A WORKSITE FOR WORK AT HEIGHT AND PREPARE A FALL PROTECTION PLAN

Learner Guide

Number:	229994
NQF Level:	04
Credits:	3
Qualification:	National certificate – Construction – Health and Safety

Table of Content

BEFORE YOU GET STARTED

Dear Learner,

This Learner Guide contains all the information to acquire all the knowledge and skills leading to the unit standard:

Title: Assess a worksite for height and prepare a fall protection plan

No: 229994 NQF Level: 4 Credits: 3

The full unit standard is attached. Please read the unit standard at your own time. Whilst reading the unit standard, make a note of your questions and aspects that you do not understand, and discuss it with your facilitator.

This Learner Guide contains all the information, as well as the activities that you will be expected to do during the course of your study.

Please keep the activities that you have completed and include it in your Portfolio of Evidence.

Your PoE will be required during your final assessment.

INTRODUCTION

A Fall Protection Plan (FPP) is a plan for workers who will be at elevated work areas. Having a detailed fall protection plan is essential to ensure the highest degree of worker safety. The plan also aims to provide a safe working environment and to administer the use of fall

The Construction Regulations 2014 define a fall protection plan;

“fall protection plan” means a documented plan, which includes and provides for_

(a) all risks relating to working from a fall risk position, considering the nature of work undertaken;

(b) the procedure and methods to be applied in order to eliminate the risk of falling; and raising a serious safety.

One of the best ways to help your employees avoid this hazard is through a solid plan. A written plan is essential to promoting high safety standards in the workplace and making sure all employees follow and understand it is just as important.

Below we will go over what a fall protection plan is, why every site with fall hazards needs one, and how to write it.

SPECIFIC OUTCOME - 1/ AC1

WORKSITE HAZARD IDENTIFICATION, JOB HAZARD ANALYSIS AND RISK EVALUATIONS

Health and Safety takes all practical steps to ensure that engineering or other controls, i.e. passive fall protection systems, are available to eliminate the need to utilize active fall arrest systems. Special consideration shall be given to eliminating and controlling fall hazards. However, certain situations and tasks are performed at locations were passive fall protection is not available and will therefore require the use of personal fall protection equipment and systems. Potential exposures to falls are routinely evaluated through regular workplace inspections and upon employee or supervisor request. Such evaluations must be performed using a standard form by a Qualified Person identified by the Program Administrator. The evaluations are maintained by Health, Safety & Environmental Department.

Locations where active fall protection systems exist or are required must be identified with signage at the access point. A review of evaluations where active fall protection systems are necessary will be reviewed annually. An often overlooked cause of falls is those resulting from slips and trips. A fall of this nature generally occurs at the same elevation and is often the result of poor housekeeping, spills, and/or inadequate maintenance of the walking and working surfaces. Due to the unpredictable nature of the exposure, workers are encouraged to self-assess conditions and to act quickly to eliminate the hazard. These hazards may include missing or broken hand rails and guard rails.

Work Practices – Walking and Working Surfaces

- **Housekeeping**

Proper housekeeping assists in preventing falls from slips and trips. All work areas should be kept clean, orderly and in a sanitary condition. The floors of work areas should be maintained in a clean and dry condition. Where wet processes are used, drainage must be maintained and gratings, or raised platforms provided. If work surfaces are temporarily wet or otherwise slippery, warning cones should be positioned in plain sight directly in front of the affected area. Every floor, working space, and passageway should be kept free of protruding nails, metal, splinters, holes, or loose grating/boards. Always sweep your work area, removing any debris, after completing your task.

- **Floor Slip Resistance**

Walking and working surfaces should be maintained in a stable, firm, and slip resistant condition. This is particularly important when employees are likely to be exposed to wet floor conditions or perform material handling tasks. The design of such environments should include considerations for how to maintain the floor; the appropriate selection of floor material to provide adequate slip resistance; and controls to reduce exposure such as floor drains and slip resistant drainage mats.

- **Floor Openings, Holes and Wall Openings**

Standard guardrail systems should be provided to prevent falls from every open-sided floor or platform except where there is an entrance to a ramp, stairway, and a fixed ladder. Floor openings may be guarded with a guardrail system or covered by a cover capable of sustaining at least twice the anticipated load. When the floor opening cover is removed a temporary guardrail shall be put in place or an attendant must be stationed at the opening to warn workers. Wall openings with a lower edge less than 90 mm and representing a fall hazard must be protected with a guardrail system. Every floor hole into which a person can accidentally walk should be guarded by either a standard guardrail system or a floor hole cover of sufficient strength. The cover should not create a tripping hazard. In some cases, a Restraining System may be used to prevent an employee from falling through a floor opening or over an edge when the floor cover or guardrail system is temporarily removed.

- **Protection from Falling into Dangerous Equipment**

Regardless of height, open-sided floors, walkways, platforms, or adjacent to dangerous equipment, tanks, pits and similar hazards must be guarded with a standard guardrail system or workers should be provided personnel fall arrest gear selected to prevent contact with the hazardous equipment, material, and/or condition.

- **Ditches**

Ditches, holes and other depressions greater than 1.2 m deep should be surrounded by a guardrail system or other substantial physical barrier to prevent falls into the opening.

- **Fixed Ladders**

Fixed ladders, including manhole ladders, must meet OSHA and Construction regulations standards to include being constructed of a material that is appropriate for the environment, capacity, dimensions and clearances.

- **Floor Loading Protection**

Load rating limits should be conspicuously posted on plates, raised platforms, and other engineered elevated structures. Never place a load on a floor or roof greater than its approved limit. Temporary covers should be able to withstand at least twice the anticipated load.

- **Work Practices – Roofs and Other Elevated Locations**

Falls from roofs may occur when an employee falls over an edge, through a skylight or down an access trapdoor. Employees may be protected from these fall hazards with either a passive control system, such as a guard rail or a parapet, or an active fall control system such as a personal fall arrest system. Roofs may be of different pitches, from flat to very steep. The roof slope will determine what fall protection systems are practical. Roofs with a slope greater than 200 mm require special considerations. In all cases, doors and access trapdoors leading to roofs or elevated surfaces with fall hazards must be locked, restricting access to authorized, trained individuals only. On buildings that are only a few stories, it is advisable to perform this work from the ground using scaffolds, or aerial lifts.

- **Flat Roofs and Elevated Surfaces**

Flat roofs and elevated surfaces are typically accessed by fixed ladders through access trapdoor or fixed stairs and doors. Fall hazards may include unprotected edges, skylights and access trapdoor. The preferred protection for these exposures is to use a passive protection system. In a passive system, the roof or elevated surface edge is protected by a standard guardrail system or a parapet that is a nominal 1 m in height. Parapets less than 1 m are not considered acceptable fall protection. An access trapdoor must be protected with guardrails. An acceptable alternative for protecting employees accessing equipment on flat roofs with unprotected edges is through the use of a designated area. The designated area must be surrounded by a rope or wire and supporting braces that can withstand a force

- **Weather Considerations**

When adverse weather conditions exist, such as high winds, heavy rain or snow, or when the accumulation of ice on surfaces especially during winter months, significantly increase the risk of slips and falls when performing tasks, a risk assessment should be conducted and where possible the work postponed until better conditions prevail or other precautions taken.

- **Training and PPE**

Supervisors must ensure that all workers have the proper training, and are fitted with the appropriate PPE to reduce the risk of incidents, injuries, and fatalities on the job.

The main danger of working at heights is either falling from height or being struck by an object that fell from height.

The main safety concerns with working at height are people or objects falling and causing serious injury and damage. Falls and falling objects can both have fatal consequences. Other significant hazards associated with working at height include falling objects and the potential for a working platform to collapse or overturn as well as contact with overhead electrical services.

It is not always easy to foresee potential fall hazards at the work site. The first step in solving the issue of potential hazards is to survey the area and create a plan of action. You need to perform an on-site analysis of existing hazards throughout the site for fall risks. Identify the hazards, which is the most important step when working at heights to meet the best practices and legislative requirements.

Below are the steps you should follow to address in your plan;

See Annexure A

Record information about the job site: This includes general information like the project manager/ foreman in charge of the project and job site location.

Process mapping and creating a flow diagram: It is the gathering and documentation of the current process situation, known as process mapping, represented in flow or diagram. At this time, we also gather the problems and fragilities, as well as the opportunities for process improvement.

FALL HAZARDS IN THE WORK AREA

In the construction sector OSHA requires fall protection for workers at heights of 2m or more above the ground or a lower level, but slips, trips, and falls can occur at any height.

Check all that apply. Include locations and dimensions next to each hazard, and/or note these hazards on your drawing above.

See Annexure B

In addition to planned height related activities, regular reviews and inspections of the site should be carried out to identify potential sources of fall hazards. All these sources must be recorded and followed up until adequate controls are provided to eliminate the hazard

When a high-risk fall hazard is identified during routine inspection, corrective and preventive measures must be established immediately before the work in the area can be allowed to continue.

JOB HAZARD ANALYSIS

A task/job analysis is any process for assessing what a user does (task), how the task is organized, and why it is done in a particular way and using this information to design a system or analyse an existing system. Task analysis is an investigative process of the interaction between operators and the equipment and/or machines they utilize. It is the process of assessing and evaluating all observable tasks and then breaking those tasks into functional units. These units allow for the evaluators to develop design elements and appropriate training procedures and identify potential hazards and risks.

Task analysis has been defined as “the study of what an employee is required to do, in terms of actions and/or cognitive processes, to achieve a system goal”.

Approaches to task analysis have been classified into three categories:

- Normative: “prescribe how a system should behave,”
- Descriptive: “describe how a system actually works in practice,”
- Formative (also called predictive), “specify the requirements that must be satisfied so that the system could behave in a new, desired way.”

The nature of the work domain and the task influences the type of analysis that is appropriate. Both the normative and descriptive approaches are applicable to analysing existing systems, while the formative approach can be applied to developing and designing a new system that will support work that has not previously been done or to allow the work to be done in a new way. The normative approach is appropriate for a very mechanical and predictable work

environment; as the work becomes more complex and unpredictable, requiring more judgment, the formative approach becomes a better analysis tool

This is an important tool to identify dangers of specific tasks in order to reduce the risk of injury to workers. Once you have identified what the hazards are, you can start to reduce or eliminate them before anyone gets hurt. The JHA can also be used for training employees to do the job safely and be used to investigate accidents.

When conducting a Job Hazard Analysis:

- **Involve employees**
  - Discuss and involve workers what needs to be done and why, as they do the job of often know the best ways to work more safely.
  - Explain that the task needs to studied not the workers performance

- **Identify the OSH Act standards** and Construction regulations that apply to your jobs. Incorporate their requirements into your JHA.

  Give priority to the following:
  - High risk jobs with the highest injuries illness rates
  - Reported near misses
  - Jobs which did not conform to the OHS act standards
  - Jobs that are new to workers

- **Identify who or what might be harmed, e.g.**
  - Maintenance staff
  - Construction workers
  - Sub-contractors
  - Cleaning staff
  - Contractors
  - Visitors
  - Vulnerable employees

- **Safety consequences** usually result from contact between the person and the plant or machinery. These could include but are not limited to the following:
  - Amputations
  - Contusions
  - Lacerations
  - Unconsciousness
  - Fractures

- Electric Shock
- Burns

- **Health consequences** are the result from existing conditions within the working environment. They usually result from exposures to fumes, dust, chemicals, radiation, noise, poor lighting and ergonomics.

  These could include but are not limited to the following:

  - Dermatitis - (inflammation of the skin)
  - Cancer
  - Asbestosis - (lung disease)
  - NIHL – (noise induce hearing loss)
  - Silicosis – (a lung disease caused by prolonged inhalation of dust containing silica) Acute and Chronic

The main difference between a JHA and risk assessment is the scope. A JHA involves specific job risks and typically focuses on the risks associated with each step of that task. A risk assessment gives a higher-level or broader view of all operational risks across and entire business, project or type of activity.

See Annexure C

RISK EVALUATION

Risk Evaluation is the process used to compare the estimated risk against the given risk criteria so as to assess the effectiveness of the significance of the risk.

The aim of the risk assessment process is to evaluate hazards, then remove that hazard or minimize the level of its risk by adding control measures, as necessary. By doing so, you have created a safer and healthier workplace.

The idea behind evaluation is to allow an organisation to make decisions regarding risk treatment and the prioritising of risk mitigation with ease.

Risk evaluation takes the risk criteria and measures against the risk analysis to determine:

- Which risks is the highest priority
- How to approach the next steps (risk treatment)

The outcome of a risk evaluation could result in several actions:

- you will either need to assign further analysis

- maintain your existing controls, or reconsider the objectives of the risk strategy in alignment with the organisation's objectives.

Regular evaluation allows you to develop a comprehensive and mature risk management strategy, as changes to risk factors, impact, consequence, and objectives can be addressed in a reasonable time frame.

SPECIFIC OUTCOME - 1/ AC2

RISK ASSESSESMENT, LIKELIHOOD AND SEVERTIY OF HAZARDS

Without a doubt, risk assessment is the most complex step in the implementation; however, many companies make this step even more difficult by defining the wrong risk assessment methodology and process (or by not defining the methodology at all).

You are required to document the whole process of risk assessment, and this is usually done in the document called Risk assessment methodology. This is where too many companies make the first big mistake: they start implementing the risk assessment without the methodology – in other words, without any clear rules on how to do it.

The three (3) Levels of Risk Assessment:

1. **Baseline Risk Assessment**: Primary, Broad based: – Geographical- Location of activities example welding on the ground has certain risk , the same task in a vessel or in elevated position identifies additional risk. – Functional - Types of activities – Pure hazards – inherently dangerous
2. **Issue-Based Risk Assessment**: – New process, Equipment. New legislation changes, Accident
3. **Continuous Risk Assessment**: – Day to Day Assessment, Pre start up checks, SHE Rep inspections, Operator checks.

Program Requirements Components

The risk management program is a dynamic process consisting of four interdependent phases:

Step 1: Identification and Classification

- PHYSICAL HAZARDS: Ionizing radiation (x-rays), Noise, Lighting, Vibration, extreme temperatures, Poor ventilation.
- CHEMICAL HAZARDS: Acids, Pesticides, Herbicides, Fumes, Dusts, Gasses, Flammable substances, Solvents, Effluent, Solid waste, Pharmaceutical (Levothyroxine) 600 micrograms humans versus rats – Chemical Physical – Pharmacological • Side Effects • Therapeutic Effects

- BIOLOGICAL HAZARDS: Vermin (rats & mice), Pathogens, Viruses, HIV/AIDS, Medical waste
- MECHANICAL Lifts, Cutting machines, Electrical hand tools, Portable electrical equipment, Lifting equipment, Forklifts, Ladders scaffold, slip trip and falls.
- ERGONOMIC HAZARDS: Manual handling, Repetitive movement, Poor design, restricted space; outdated design & technology, work stations. Prolonged standing
- PSYCHO-SOCIAL HAZARDS: Shift work, Peer pressure, Alcohol / Drug misuse, Stress ENVIRONMENTAL ASPECTS: Contaminated air and water, hazardous waste, Resource use

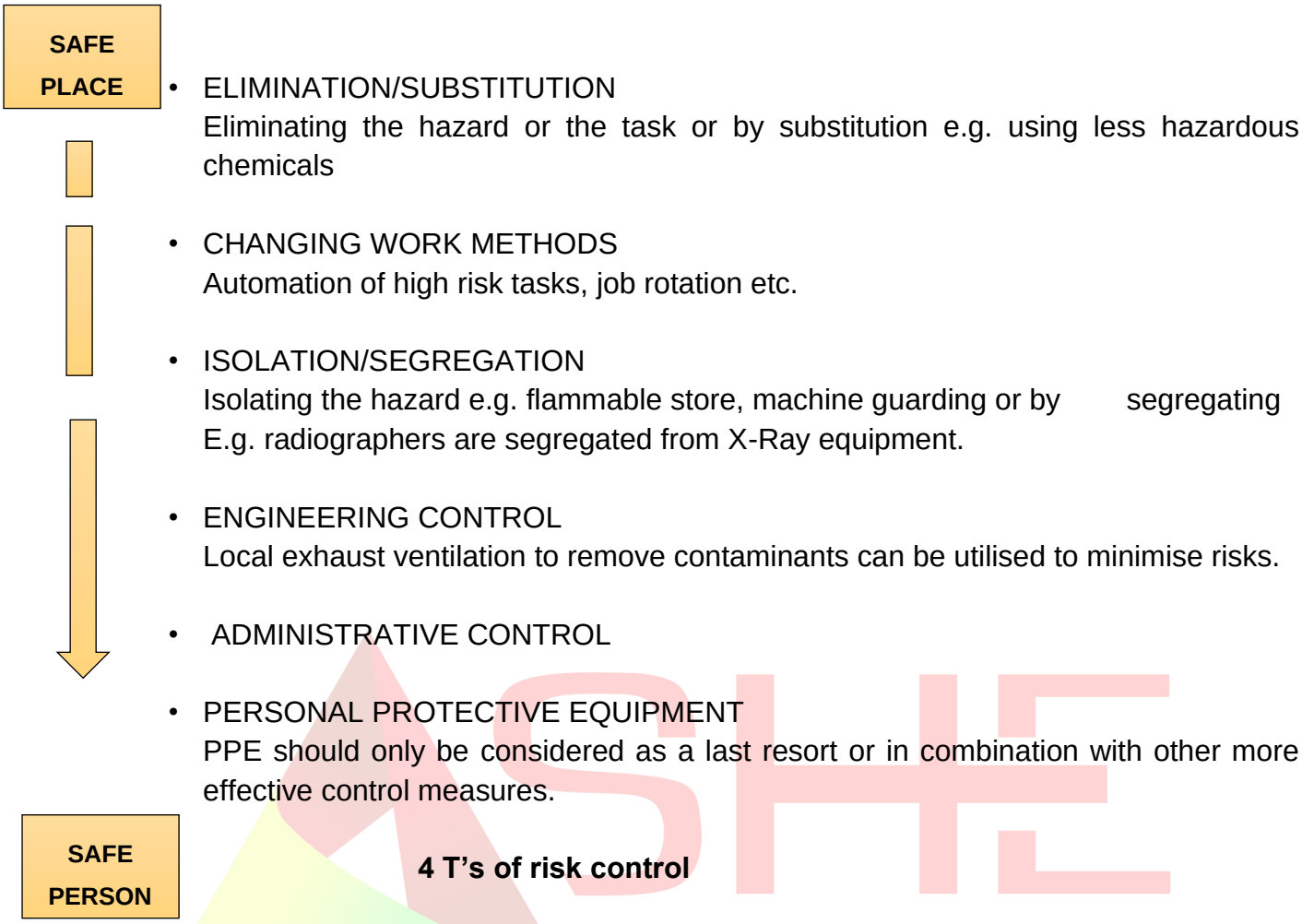
Step Two: Analysis Decide who might be harmed & how?

- Operator type (Final assembly)
- Maintenance staff
- Support staff
- Cleaning staff
- Contractors
- Visitors
- Vulnerable employees

Step 3: Evaluation (to prioritise risks for action)

- Quantitative risk assessments
- Numerical value assigned giving hazards measurable qualities to prioritize.
- Qualitative risk assessments
- Rely on experience and opinion of risk assessors and team
- You cannot argue one risk assessments better than the next.
- One must keep in mind that the success of any evaluation methodology employed is measured on the outcomes it has achieved.
- Must pass the test of reasonably practicability.
- There may be several risk related to one hazard.

Hierarchy of Control/ Prevention



4 T's of risk control

General Principles of Prevention order of priority

a. Eliminate the hazard/risk
b. Control the hazard/risk at source, through the use of engineering controls or organisational measures
c. Minimise the hazard/risk by the design of safe work systems, which include administrative control measures
d. Where residual hazards/risks cannot be controlled by collective measure, the employer should provide for
e. Appropriate personal protective equipment, including clothing, at no cost, and should implement measures
f. To ensure its use and maintenance

Risk Likelihood/Frequency ratings, Risk Consequence/Severity Ratings, Effectiveness of Control

Likelihood ratings

Likelihood	Description
Almost never **Rare 1 - 2**	The risk event may occur only in exceptional circumstances, e.g. up to 4% change of occurring in the next 12 months
Unlikely **2 – 3**	The risk event could occur at some time e.g. 10& change of occurring in the next 12 months of 1 out of every 10 years
Possible **3 -5**	The risk event should occur at some time e.g. 25% change of occurring in the next 12 months or 5 out of every 20 years
Likely **6 -7**	The risk event will probably occur in most circumstances, e.g. 55 % change of occurring in the next 12 months or 11 of every 20 years
Almost certain **8 – 9**	The risk event is expected to occur in most circumstances

Consequences / Severity ratings

RISK Consequence / Impact	Definitions
Minor (1 -3)	- Financial impact of up to R 25,000.00 in any 12 month period; and/or - Loss or reputation or image that involves local adverse media coverage - Event that involves management time
Moderate **(3 – 5)**	- Financial impact of up to R 100,000.00 in any 12 month period; and/or - loss of reputation or image that involves widespread, adverse media coverage and/or potentially involves litigation; and/or - event that involves a reasonable amount of management time
Severe **(5 – 7)**	- Financial impact of up to R 500.000.00 in any 12 month period; and/or - loss of reputation or image that may take up to 1 year to recover and /or potentially involve litigations; and / or - event that involves significant management and/or Corporate counsel time
Major **(7 – 8)**	- Financial impact of up to R 1 mil in any 12 month period; and/or - loss of life or serious harm injury; and/or - loss of reputation or image that may take 1 – 3 years to recover and involves a damaging litigation claim
Catastrophic **(9)**	- Financial impact of up to R 1 mil or more in any 12 month period; and/or - multiple loss of life; and/or - loss of reputation or image that may take 3 – 5 years to recover

Effectiveness of Controls	
Very poor (1)	20 % or less effective
Unsatisfactory (2)	30 % approximately effective
Good (3)	50 % approximately effective
Very good (4)	70 % approximately effective
Excellent (5)	80 % plus, effective

Effectiveness of Controls

- Look at standards and requirements and if they are in place i.e. lock out procedure.
- Engineering controls i.e. Guarding, barriers
- Administrative control i.e. Job rotation SOP, medical surveillance, monitoring and measurement and training programs.
- PPE: Goggles, safety shoes us used as a last resort.

Hazard prevention and control procedures or arrangements should:

- Be adapted to the hazards and risks encountered by the organisation
- Be reviewed and modified if necessary on a regular basis
- Comply with national laws and regulations, and reflect good practice
- Consider the current state of knowledge, including information or reports from organisations, such as labour inspectorates, occupational safety and health services, and other services as appropriate

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- Comply with national laws and regulations, and reflect good practice
- Consider the current state of knowledge, including information or reports from organisations, such as labour inspectorates, occupational safety and health services, and
- other services as appropriate

Action Plan Once you have identified the necessary control, you may put an action plan together for your program. Such a plan should include:

- Short-term controls that are cost-effective and can reduce the risk with little fuss

- Long-term solutions for significant risks (preferably engineering or elimination controls) which would further reduce the risk
- Actions for training or conveying the information regarding the risks
- A means to follow up implementation of the plans
- Assignment of responsibilities and roles for accountability
- A time frame for implementation

Record your findings

Significant findings and action plans recorded as proof of implementation and control.

- Hazards, risks and ratings
- Affected persons, groups and departments
- Existing controls
- Planned controls
- Persons responsible for implementing controls
- Reference to standards, legislation, codes of practice Raw Risk Score

Raw Risk Score

- Raw Risk = Risk without controls in place S x (P + E) other examples are S x P x E etc.
- Residual Risk ='Residual Risk' refers to the level of risk that remains after controls have been implemented.

N - Normal circumstances: indicates a hazard which occurs under normal operating conditions, i.e. the way a process or activity is presently carried out during every day routine work

A - Abnormal circumstances: indicates hazard which occurs during planned or unplanned non-daily routines that may occur around a process or activity, i.e. maintenance, plant up-grades, start-up/shut down

E - Emergency circumstances: indicates a hazard which may lead to emergency conditions, i.e. catastrophic incidents or accidents which are unplanned events

Simple risk-ranking Matrix

		Severity of harm		
		Slight (1)	**Serious (2)**	**Major (3)**
Likelihood of harm	LOW (1)	**1**	**2**	**3**
	MEDIUM (2)	**2**	**4**	**6**
	HIGH (3)	**3**	**6**	**9**

Hazard Identification & Risk Assessment Item Task Hazard Risk

Item	Task	Hazard	Risk	S SAFETY	H HEALTH	E ENVIRONMENT	Legislation	Exposure (E)	Probability (P)	Severity Index (S)	Risk score	Rating	Current Controls (Mitigation)	Residual Risk Score E	P	S	Risk score
Cleaning Mixers (Plant 1 and Plant 2)																	
1	Cleaning Mixers	Electrical - Emergency stop button	Shock	x				6	6	15	540	VERY HIGH RISK	SWP & PM Schedule	6	1	15	90
2		Electrical - Switch box	Shock	x				6	6	15	540	VERY HIGH RISK	SWP & PM Schedule	6	1	15	90
3		Manual handling - removing mud with poker	Back injuries	x				6	6	3	108	SUBSTANTIAL RISK	Train employees	6	3	3	54
4		Entanglement - with screws if they have not stopped	Loss of limbs	x				6	1	15	90	SUBSTANTIAL RISK	SWP & Train Employees in procedures	1	1	15	15
5		Chemical - Carbon black (large quantities - if cover is removed)	Respiratory damage		x			6	10	7	420	VERY HIGH RISK	PPE	6	1	7	42
6		Chemical - Carbon black (large quantities - if cover is removed)	Ground and water pollution			x		6	10	3	180	SUBSTANTIAL RISK	Concrete Floors, Seperate drainage system, effluent plant, recycle water	6	3	3	54
7		Tripping hazards - hoses	Injury to employees	x				10	6	3	180	SUBSTANTIAL RISK	Housekeeping	6	1	3	18
8		Slipping hazard - washing screws or area around mixer	Injury to employees	x				6	6	3	108	SUBSTANTIAL RISK	PPE	6	3	3	54

Likelihood or frequency (L): How often can the event be expected to happen?

Likelihood Class	**Factor L**
Might well be expected	10
Quite possible	6
Unusual but possible	3
Only remotely possible	1

Exposure (E): How often is the person exposed to the operation?

Exposure Index	Factor E
Continuously or Inherently Hazardous	10
Daily (few times per day)	6
Weekly (few times per week)	3
Monthly (few times per month)	2
Annually or less often	1

Severity (S): What is the outcome of the event should it occur?

Severity Index	Factor S
Irreversible effect	5
Severely harmful	4
Harmful	3
Slightly harmful	2
Minimal Effect	1

Mitigation Measures

No Effective Mitigation	1
Written Procedure and PPE	2
Training Complete	3
Monitoring & Measurement Conducted	4
Preventative Maintenance Conducted	5
Engineering Method Effective e.g. guarding	6
Project Completed to remove or reduce risk substantially	10

RAW Risk = L (Likelihood) X E (Exposure) X S (Severity) assuming there are no controls in place (current or envisaged).

RESIDUAL RISK = RAW RISK ÷ M (Mitigation) (Consider Mitigation measures already implemented and compliance to controls and procedures).

- **RAW RISK**= L (6) X E (10) X S (4) = 240
- **RESIDUAL RISK**=240/2 = 120

RISK CLASSIFICATION

RISK DESCRIPTION	RISK VALUES
Low	< 50
Medium	50 – 99
High	100 – 299
Intolerable	> 300

Risk Severity

Severity (degree of harm in terms of injury or ill health or extent of damage to the environment)

	Safety	Health
3	First aid	Physical discomfort Irritation Recurrent pain
6	Medical aid	Temporary disablement Illness & time off work
9	Medical aid	Permanent disablement Permanent damage to health
12	Fatality	Terminal illness
15	Multiple fatalities	Multiple persons terminal illness

Probability

	Probability (likelihood of the occurrence of a specific outcome, i.e. 'Risk')
4	Rare = almost impossible
8	Unlikely = has happened before in industry
12	Possible = happens regularly in industry
16	Likely = has happened before in this employer
29	Certain = happens regularly in this employer

Exposure

Exposure (the number of persons, expressed as a % of the facility, that could be exposed to a specific H&S risk; the geographical extent to which the environment could be exposed to a specific impact)

Rating	Number of persons exposed	Environmental exposure
2	0-20%	Site specific
4	20-40%	Immediate surroundings
6	40-60%	Local community
8	60-80%	Regional
10	80-100%	National

Raw Risk = Risk without controls in place

S x (P + E) other examples are S x P x E etc.

Residual Risk ='Residual Risk' refers to the level of risk that remains after controls have been implemented.

Review and Update - Review if significant changes:

– New machinery/equipment
– Relocation of plant or machinery
– New substances
– Legislative changes/directives
– Personnel changes
– Accident, Incidents or near misses
– New standards
– Audit or monitoring findings

• Periodic review (usually annual)

Communication and Monitoring

- All departments and business units shall:
  - investigate incidents to determine their causes
  - assess the extent and value of damages and determine potential legal liability
  - establish new or improved measures to help prevent the recurrence of incidents
  - maintain their own risk management data-base as part of the feedback system of information management and communication

- Annually review the risk management process to determine its effectiveness
- communicate relevant information to assist in managing any incidents, claims, public perception or litigation.

• Internal Audits should be performed periodically to monitor and assess the efficiency and effectiveness of the management program.

Responsibilities

Every employee is responsible for the effective management of risk, including the identification of potential risks. Management is responsible for the development of risk mitigation plans and the implementation of risk mitigation strategies.

Chief Executive Officer

The delegated manager, in terms of section 16(2) of the OHS Act, together with appointed responsible managers as defined in the OHS Roles and Responsibilities and Statutory Appointments Standard shall be responsible for safety in their designated area of responsibility. Each department shall, where required, compile appropriate work instruction documents to support this standard.

The Chief Executive Officer is responsible for ensuring that a risk management program is established, implemented and maintained in accordance with the company policy.

Monitoring

Risk management extends beyond merely setting out systems and procedures. The process requires monitoring and assessment. The CEO (16.2) is charged with the valuation and improvement of the risk management process in executing its operational objectives and to ensure that the risk management program is a dynamic process. Methods of communicating, the risks to which the employees are exposed to and the measures in place to mitigate and control such risks include the Risk Register and the Risk Treatment Schedule and Action Plan.

Incident Reports

After the occurrence of a incident, it is critical that staff members prepare a timely report that includes the results of an investigation and an assessment of the loss or damages.

Investigating the facts of a harmful or damaging incident has four purposes:

- Establishing its cause

- Assessing the extent and value of damages and potential legal liability
- Providing a data-base in support of submissions for approval to pay claims; and
- Providing feedback on the effectiveness of existing control measures, and acting as a basis for establishing new or improved measures to prevent a recurrence.

SPECIFIC OUTCOME - 1/ AC3

RISK ASSESSMENTS LEGAL REQUIREMENTS

The requirements of the person performing risk assessments are based on the Construction Regulation 2014 legal requirements.

- The designate person performing the risk assessments must be a competent person responsible for the preparation of a fall protection plan

  The fall protection plan developer must have the following training :

Unit standard 229998: Refers to the following assessment criteria to explain and perform fall arrest techniques when working at height and suitable for performing work at height under supervision:

The following indicate the assessment according to worksite procedures.

- Compatibility of equipment of include but is not limited to size of anchor, sharp items, prevent damage, point loading, size of hook.
- Connectors include but are not limited to maillots (stretching fabric), locking karabiner, double action snap hook, pylon hook, double action scaffold hook.
- Energy absorber includes fall arrest harness and work positioning system, Energy absorbing lanyards include.
- Fall arrest equipment include full body harness, helmet, work positioning system, lanyard and energy absorber, shock absorbing lanyard, retractable life-line.
- Fall arrest system includes energy absorbing lanyard including 2 singles, v-type, double legged lanyard or double lanyard.
- Hardware includes connectors, locking karabiner, double action hooks. Inspection criteria for hardware include checking hardware for damage, deformation and functioning.
- Lanyards include single legged lanyards, work positioning lanyards.
- Legislation governing the safety of work at height includes awareness of the existence of legislation and regulations.
- Limitations of an energy absorbing lanyard include distances (2 meters)
- Medical Surveillance/Physical Requirements

- Employees utilizing personal fall arrest systems are expected to be physical fit with no physical conditions that could be aggravated by, or cause the employee harm, if he or she was involved in a fall and was to rely on the fall equipment for life safety.
- These include but are not limited to heart disease, high blood pressure, epilepsy, fits and blackouts, fear of heights, giddiness or difficulty with balance, impaired limb function, alcohol or drug dependence, psychiatric illness, diabetes.
- PPE include but is not limited to helmets with a chinstrap, gloves, goggles, safety footwear, close-fitting overalls or items specified for the task. Inspection criteria for helmets include damage, intact chinstrap.
- Risks while awaiting rescues can include suspension trauma, position, physical injury, injury from hot surfaces, electricity, fumes, water. Feet to be kept moving to prevent reduced flow of blood to the brain that can lead to unconsciousness or death.
- Slings include but are not limited to certified tape slings, wire slings and rope slings.
- Software includes harness, work positioning harness, and absorbing lanyard. Inspection criteria for software include checking stitching, webbing, identification or labels, buckles, D-rings and connectors.

Unit standard 229995: refers to assessment criteria suitable for performing work at height under supervision.

- Install, use and perform basic rescues from fall arrest systems and implement the fall protection plan
- The fall protection plan developer must ensure that the fall protection plan is implemented, amended where and when necessary maintained and the Project Manager must have the latest copy of the fall protection plan at all times.
- The Project Manager must ensure compliance with the fall protection plan and take steps to ensure continured adherence to the fall protection plan
- The person doing the Risk Assessment should have knowledge of the type of work, the type of exposure, the employees or people that are exposed, relevant legislation and the type of control measures to be put in place.
- You must consult your staff or their representatives in the risk assessment process. They will have useful information about how work is done which will help you understand the actual risks.

- You may find that there are a number of issues which need action, so you need decide on your priorities for that action. In thinking through your priorities, think about the biggest or most serious risks first.
- Having identified the priorities, you need to decide on the controls which you will put into place. In doing so, think about the following:
- Long-term solutions to those risks with the worst potential consequences
- Long-term solutions to those risks most likely to cause accidents or ill health whether there are improvements that can be implemented quickly, even as a temporary solution until more reliable controls are in place
- Remember, the greater the risk the more robust and reliable the control measures will need to be
- Recognise and control hazards and exposures in the workplace
- Create awareness among employees and also use it as a training tool. Set risk management standards based on acceptable self-practices and legal requirements
- Reduce incidents in the workplace and save costs by being proactive instead of reactive.
- To effectively identify hazards and assess risks in the workplace, you'll need the assistance of all your employees.

Remember the process doesn't stop with the identification and assessment of hazards and risks. Once the first part of the process has been completed, risk management actions need to be taken. Through awareness and training, you'll ensure compliance to risk management requirements and a high level of system effectiveness.

SPECIFIC OUTCOME - 1/ AC4

SAFE WORK PROCEDURES - MONITORING AND REVIEW PLANS

Safe work procedures (SWP's) are required when the risk of injury to workers performing a job task cannot be eliminated by effective work design, work process or equipment. Employers must ensure SWP's are based on information gathered by a risk assessment. They must also be developed in consultation with your workplace safety and health committee or representative and be approved by management. Workers must be trained in the safe work procedures so they understand the steps and equipment they must use to work safely. Supervisors must ensure that safe work procedures are followed. Safe work procedures should be readily available to workers for reference.

Safe work procedures do not have to follow a particular format, however, your safe work procedures should include:

- name or description of the work task
- date the SWP was created and date it was last reviewed or revised
- hazards that may cause harm to a worker
- common signs and symptoms of a musculoskeletal injury if the hazards of the job task could lead to this type of injury
- equipment / devices, personal protective equipment (PPE), or other safety considerations necessary to perform the task safely
- required training and / or relevant documentation needed to perform the task safely
- steps to perform the task safely including safe body positions and / or movements as appropriate
- indication that workers are to be trained on the SWP and employers must ensure workers follow them

Remember to review your safe work procedures regularly to ensure they are accurate and effective. If a task or equipment changes, the safe work procedure(s) that relate to this change must also be updated.

OSHA requires that fall protection be provided at elevations of 1.2 metres in general industry workplaces and 1.8m in the construction industry.

Example 1:

OBJECTIVE: Objectives of this procedure is to provide rules and procedures to protect employees from the hazards of working at heights and to establish mandatory requirements for practices to protect personnel from hazards associated with Working at Heights.

SCOPE: This SWP applies to all operating and project sites of ABC group of companies involving in Work at Height Jobs.

EXPECTED RESULTS:

- Manage Work at Height jobs being done under Permit-To-Work safely.
- Control of incidents related to Work at Height Jobs.
- Compliance to Regulatory requirements to make work place safety

EXAMPLE 1: **SAFE WORK PROCEDURE:**

- Proper scaffolds and/or temporary work platforms shall be provided for working at height at elevations 1.8 meters or more where no permanent work platform is available to work safely. The elevated work platforms shall have guardrails and provided with ladders for access/egress.
- Where it is not feasible to erect scaffolds, suitable hydraulically elevated work platforms or portable platform with wheel locks / chokes and guardrails shall be used.
- Ladders shall not be used as work platforms.
- Employees or contractors working on unguarded surfaces, steep slopes and similar locations; temporary platform, during scaffold construction; or when otherwise exposed to the possibility of falls hazardous to life or limb, shall be secured by full body harness with double lanyard.
- Full body harness with double lanyard shall be worn when work requires persons closer than 1.8 meters from roof edge without parapets, or floor opening. Note: Uncontrolled once printed
- Full body harness with double lanyard shall be used by persons where work requires persons to move or walk from one place to another for changing work locations at height and where it is not feasible to provide guarded platforms and scaffolds (e.g., pipe racks) so as to ensure one lifeline is always tied with a fixed support.

- Persons shall always keep one lanyard anchored/tied with the fixed support while walking/moving on unguarded surface/edges or structures.
- Where ever appropriate fixed support is not available to anchor lanyard of full body harness, lifelines certified by qualified inspector shall be used to anchor lanyard.
- The intended load shall not exceed the maximum working load of portable work platforms.
- Full body harness, lanyard and snap hook, which conform SABS standard, (SANS 10085-1993) shall be used. Safety belts are prohibited.
- Lanyard shall be attached to the D-ring on the back of the Full body harness between the shoulder straps.
- Snap hooks shall be of double locking type.
- Fall arresting devices may be used depending on the requirement of situation, i.e. painting, wall painting, or working on the towers, etc.
- Anchor points for fall arresting systems must be capable of withstanding (as per SANS 10085-1993) l per person attached.
- Personal Fall Arrest System components shall be visually inspected before each use.
- Proper area barricading to prevent people walking across below the working area shall be done before commencing any work at height. If such barricading is not possible, safety net shall be provided and “Work in Progress” boards shall be displayed.
- A process shall be in place to ensure employees are medically fit to perform their duties and that their health is not adversely affected by occupational hazards
- No working at height shall be carried out without supervision.
- Job Safety Analysis (JSA) shall be conducted for Working at Height which includes access & egress from one anchorage point to another anchorage point.
- Permit-To-Work Procedure shall be followed for all Work at Height.
- Working at Height after daylight hours shall be authorized by Project Manager with appropriate control in place.
- When performing man lift operations, all personnel in the personnel basket (platform) shall wear a full body double harness with the lanyard attached to the man lift or permanent structure.
- Scaffolding shall be erected as per Scaffolding Procedure
- In case of hazard of Honeybees, help from pest control, water spray, steam jet and PVC apron with hood shall be used.

- Installation of a Guardrail System around the work area is required for fall protection. Guardrail Systems shall meet the following minimum requirements:
- Top rail (handrail) shall be 1200 mm from the working surface. Top rails must be capable of withstanding an expected force which may arise while working.
- Mid rails shall be located midway 600 mm between the top rail and the working surface. The mid rail must be capable of withstanding a force of 70kg.
- Toe boards should be provided to prevent persons falling off the working surface.
- Screens or panelling from the toe board to the mid or top rail should be required when equipment or material is piled higher than the toe board and is capable of being ejected from the working surface to the level below.
- Where gates or openings are required in the guardrail system to facilitate material movement, personal fall arrest or restraint systems shall be used.
- All platform / walkway above 1.8 M from floor shall be provided with guardrail system.
- Every floor opening into which any person can fall shall be guarded by a standard guardrail system or by a grating duly fixed in position.
- Any floor opening, for temporary maintenance work, shall be fixed with proper size cover having sufficient strength.
- Fall arrest systems mitigate the consequences of a fall. The system consists of a proven anchor point, connectors, full body harness, and lanyard and deceleration device. The entire system shall be capable of withstanding impact forces involved in stopping or arresting the fall. Consideration must be given to what is below the area of work and what the person may strike during the fall.
- Fall Protection system is full body harness with double line lanyard of 1.8 meters length out of which, one has to go to the fixed anchorage and another one for movement. Shock absorbers are preferred to ascertain adequacy of harness in case of sudden fall.
- Safety nets shall be provided for protecting from human fall and material fall.
- Hand tools used while working at height should be securely tied to avoid free fall in case of accidental slippage. Personal Fall Arrest System components shall be visually inspected before each use.
- Lifelines shall be installed or modified only by Qualified Installers.
- When more than one person will be utilizing a lifeline simultaneously, the load allowance of the lifeline shall be increased so as to provide the same level of support as it did while one person was using it. This use has to be approved by qualified person.

- Provision shall be made for routine inspection and maintenance of all ladders. Broken or damaged ladders shall be promptly repaired or removed and destroyed.
- Securing ladders: All ladders shall be placed on firm ground, secured at top and intermediate positions to maintain them rigidly in place and to support the loads imposed upon them. Restrictions: Ladders will not be used as work platforms or scaffolding or as structured members of scaffolds or walkways.

Rev no.	Reason for Revision	Prepared by	Reviewed by	Approved by	Date
00	Initial release	Abc	Def	Ghi	
01	Standardization of Procedure	Abc	Def	Ghi	

REVIEW: Review of this procedure shall be done as and when but not later than once in every three (3) years. Typical Factors like changes in legislation, Review of Incident Reports, Inspection & Audit findings, Feedback from users, recommendations in Incident investigation reports may be inputs for the review and revision of the procedure.

Construction workers should only work at heights when it is absolutely unavoidable. When the greenlight is given to work at height, the effective implementation of a standard procedure can drastically reduce the associated risks and hazards. Below is an example of a standard procedure when working at heights:

EXAMPLE 2: See annexure E

MONITORING

Process monitoring: This is referred to as 'activity monitoring.' Process monitoring is implemented during the initial stages of a project as its sole purpose is to track the use of inputs and resources, along with examining how activities and outputs are delivered. It is often conducted in conjunction with compliance monitoring and feeds into the evaluation of impact.

Compliance monitoring: The purpose of compliance monitoring is to ensure compliance with contract requirements, local governmental regulations and laws, and most importantly compliance with the expected results of the project. The need for compliance monitoring could arise at any stage of the project life cycle.

Related/Supporting documents

- Appointment of a Fall Arrest System Inspector
- Inspection checklist for FAS
- Personal Protective Equipment for work at heights specification
- Risk assessment template
- Fall Protection Plan Compiler
- Inspector of Fall Arrest Systems – CR 10 (2)(d)
- PPE for Work at Heights Specification

Context monitoring: Context monitoring is also called 'situation monitoring.' It tracks the overall setting in which the project operates. Context monitoring helps us identify and measure risks, assumptions, or any unexpected situations that may arise within the institutional, political, financial, and policy context at any point during the project cycle. These assumptions and risks are external factors and are not within the control of the project, however, context monitoring helps us identify these on time to influence the success or failure of a project.

Process evaluation

It is conducted as soon as the project implementation stage begins. It assesses whether the project activities have been executed as intended and resulted in certain outputs. Process evaluation is useful in identifying the shortcomings of a project while the project is still ongoing to make the necessary improvements. This also helps to assess the long-term sustainability of the project.

Outcome evaluation

This type of evaluation is conducted once the project activities have been implemented. It measures the immediate effects or outcomes of the activities and helps to make improvements to increase the effectiveness of the project health, safety and environment.

SPECIFIC OUTCOME - 1/ AC5
PROTECT AND PREVENT FALLS OF PEOPLE, EQUIPMENT AND MATERIALS

PREVENTION vs. PROTECTION

A textbook definition of fall protection could read: “A method to prevent a person from falling or reducing the distance of a fall to limit physical damage.” Most would agree the first part of the above definition addresses fall prevention and is the more preferred strategy.

However, reality shows us prevention methods are not always available and in many situations fall protection is our only option. If the fall hazards cannot be eliminated, the next approach is to select the appropriate fall protection system.

Of course, no single fall protection system provides adequate fall protection for all job activities. As the type of system will vary from job to job, we must always assess each job and activity to determine the proper type of fall protection.

A task-specific/job-specific Fall Protection Plan shall be developed and approved by a competent fall protection plan developer for any activity where there is a risk of a fall.
A competent fall protection plan developer must be appointed according to regulation 10(1)(a) of the Construction Regulations.

The Fall Protection Plan shall include a task/job-specific risk assessment and requirements relating to the following:

- The training programme for employees working from a fall risk position
- Appointments and authorisations
- The procedure addressing the inspection, testing and maintenance of all fall protection equipment
- A risk assessment that is site-specific with regard to fall risks for work to be performed
- The processes for the evaluation of the employees’ medical fitness necessary to work in a fall risk position and the records of this (medical surveillance programme)
- Equipment use and specification
- Fall prevention, fall arrest and fall rescue
- Method statements or safe work procedures/task analysis/work instructions.

Adherence to the Fall Protection Plan is mandatory.

- The Fall Protection Plan must be suitably amended in accordance with the risk assessment, equipment technology, standards and legislation.
- The Fall Protection Plan must be monitored and reviewed as required by the work performed and changes in hazards.
- The Fall Protection Plan must include the rescue plan.
- Adherence to the Fall Protection Plan is mandatory.
- The use of a work-positioning belt with a work-positioning lanyard (safety belt) without a full body harness and fall arrest system is strictly prohibited for fall arrest purposes.
- Equipment should not place a load greater than 6 kN or as per relevant SANS or accepted international standards on the user in the event of a fall. The equipment should protect the user from impact with the ground or surrounding structures, as well as injury from the harness in the event of a fall.
- Expiration dates for FAS equipment as determined/specified must be adhered to during usage and inspections in terms of the retirement of equipment and suitability for usage stipulated by the manufacturer.

Anchor points

- The selection of anchor points is determined by the type of work and structure involved.
- Certain structures may not provide adequate strength for fall arrest purposes. In such cases, alternative means of fall protection have to be developed, based on an appropriate risk assessment.
- Dedicated fall arrest anchor points shall be tested annually, according to SANS, and records of such tests kept.
- Dedicated anchor points must be clearly marked as such, with the load-bearing capability, direction of use, date of inspection, standard to which it was tested, and unique serial number.
- If there is any doubt about the structural adequacy of the anchor structure, a structural engineer will make an assessment and sign off the structure.
- Employees have to be able to connect to anchor points before they enter a fall risk position.
- Anchor points must, as far as practicable, be placed above the worker to minimise the fall distance and pendulum effect.

- Rope or webbing anchor slings may not be placed around a structure with sharp edges without adequate protection.
- In vertical or diagonal orientation, sufficient means must be used to prevent the sling from sliding, for example by double-wrapping the attachment sling or by attaching it to a cross member and choking is only allowed for slings designed for choking.
- Handrails may not be used as anchor points for any fall arrest equipment or fall arrest systems, unless they have been specifically engineered and certified for this purpose.

Safe use of equipment and systems

The following apply to any work where fall arrest is required:

- The user of fall arrest equipment should be connected to at least one anchor point/fall arrest system whenever that user is at risk of falling.
- Equipment and systems must be used according to the manufacturer's instructions
- Equipment must be carefully handled to ensure that no parts are damaged.
- The user must ensure that the equipment is in good working order and has been serviced, inspected and maintained before and after use.
- Defective equipment may not be used and must be removed from circulation, destroyed or marked as defective.
- Users must check the correct assembly of the equipment before use, for example check that all buckles are used correctly; no clothing is caught in snap hooks, etc.
- The carrying of hand tools must not interfere with the movement of the operator or the working of the system; a tool bag with a rope must be used to attach tools.
- Equipment shall be stored in a cool, dry environment away from chemicals.
- If the equipment has arrested a fall, it must be withdrawn from service and referred for inspection.

Fall over sharp edges

Where lanyards can strike a sharp edge in the event of a fall, the result may be a failure to arrest the fall safely or a complete break in the lanyard. Selecting a different anchor point or protective covering can overcome this hazard.

Fragile work surfaces

- As far as reasonably practicable, avoid work or movement over fragile surfaces.

- Provide and use, as far as is reasonably practicable, suitable and sufficient platforms, coverings, guardrails or similar means of support or protection so that any foreseeable load is supported by such supports or borne by such protection.
- Where a risk of a person at work falling remains despite the measures taken, suitable and sufficient measures must be taken to minimise the distances and consequences of a fall.
- Prominent warnings notices are, as far as is reasonably practicable, affixed at the approach to the place where the fragile surface is situated, or persons are alerted to the risk by other means if this is not practicable.

On fragile surfaces such as roofs, where there is a risk of falling through or over the edge, the following must be taken into account:

- Potential fall distance – a fixed-length lanyard can cause an unacceptably long fall close to the anchor if the fall is through the surface;
- Fall clearance – the areas around and underneath the surface have to be checked for potential obstructions;
    - Sharp edges;
    - Swing clearance;
    - The use of walkways, preferably with handrails, is the preferred method of movement over fragile surfaces.

Restraint systems

Restraint systems are suitable for areas where the users can maintain a secure footing without tensioning the system or using their hands to do so. Fall arrest systems should be used in the following situations:

- If the users can reach a point where they can fall over an edge;
- If the restraint line can be adjusted in length, resulting in a fall position;
- If the user can fall through a fragile surface;
- If any other reasonable misuse of the system could result in a free fall;
- Where restraint systems are in use, adequate controls and supervision must be in place to prevent the misuse of the system.

Work platforms and access to work areas

- Make sure that access to work areas does not present any fall hazards, for example, open holes or fragile surfaces.
- Select the correct means of access to the work area, taking into account the job requirements; for example use a scaffold to create a safe work platform for a longer job duration and heavier work, and use rope access instead of a scaffold for jobs of shorter duration.
- Make sure that the operator, for example a mobile elevated-platform operator, of the access equipment is properly trained in the use of the equipment.

Every work area or means of access or egress at height must:

- be stable and of sufficient strength and rigidity for the purpose for which it is intended to be or is being used
- where applicable, rest on a stable, sufficiently strong surface
- be of sufficient dimensions to permit the safe passage of persons and the safe use of any
- plant or materials required to be used and to provide a safe working area, having regard to
- the work to be carried out there
- possess suitable and sufficient means for preventing a fall
- possess a surface that has no gap through which a person could fall or through which any material or object could fall and injure a person
- be constructed, used and maintained in a condition to prevent, as far as is reasonably
- practicable the risk of slipping or tripping; or any person being caught between it and any adjacent structure
- where it has moving parts, be prevented by appropriate devices from moving inadvertently during work at height be so erected and used as to ensure that its components do not become accidentally displaced so as to endanger any person when altered or modified, be so altered or modified as to ensure that it remains stable and does not alter the integrity, and be dismantled in such a way as to prevent accidental displacement.
- A working platform and any supporting structure may not be loaded to the point where it presents a risk of collapse or any deformation that could affect its safe use. Safe work load shall be displayed.
- Scaffolding may be assembled, dismantled or significantly altered only under the supervision of a competent person and by persons who have received appropriate and

specific training in the operations envisaged, which training addresses specific risks that the operations may entail and the precautions to be taken and, more particularly, in:

- understanding the plan for the assembly, dismantling or alteration of the scaffolding concerned safety during the assembly, dismantling or alteration of the scaffolding concerned
- measures to prevent the risk of persons, materials or objects falling
- safety measures in the event of changing weather conditions which could adversely affect the safety of the scaffolding concerned
- permissible loadings; and any other risks that the assembly, dismantling or alteration of the scaffolding may entail.

Personal fall-arrest systems – consists of an anchor, connectors, and a full body harness that work together to stop one from falling and to minimize the arrest force. Other system components may include a lanyard, a deceleration device, and a lifeline. However, the personal fall-arrest system is effective only if you know how all of the components work together to arrest the fall.

Guardrail systems are vertical barriers consisting of top rails, mid rails, and intermediate vertical members. Guardrail systems can also be combined with toe-boards, which are barriers that prevent materials and equipment from dropping to lower levels.

Safety net systems consist of mesh nets, panels, and connecting components. They are typically used as protection for those who work ≥7 meters or more above lower levels.

Warning-line systems consist of ropes, wires or chains, and supporting stanchions (vertical metal columns with fence-like rails mounted on them) that form a barrier to warn those who approach an unprotected roof side or edge. The lines mark off an area which one can do roofing work without using guardrails or safety nets.

Safety-monitoring system is a set of procedures assigned to a competent person for monitoring or warning workers who may be unaware of fall hazards. Safety-monitoring systems are appropriate for roofing operations on low-slope roofs, and used in conjunction with a controlled access zone and a fall-protection plan is also appropriate in situations where conventional fall protection is not feasible.

Controlled-access zones is a work area designated and clearly marked in which certain types of work may take place without the use of conventional fall protection systems – guardrail, personal arrest or safety net – to protect the employees working in the zone.

Tool Safety Lanyards securing your tools with a tool tether ensures that, if dropped, the tools will not pose a hazard to yourself or anyone down below.

Training

- Every employer shall ensure that no person engages in any activity in relation to work at height unless they are competent to do so.
- All persons who work from height or who will be required to rescue from height shall receive rescue training in accordance with the unit standard.
- The date of training shall be indicated on the certificate with no expiry date.
- One job observation per annum shall be conducted on each person working at height.
- The employer shall determine the need for refresher training, taking into account factors such as period of inactivity and changing circumstances as determined from risk assessments and job observations.
- Rescue training shall expire after three years.
- Documented training records for all work-at-height training must be maintained and filed for auditing purposes

Disposal of working at height safety equipment

There must be a work instruction for the disposal and/or destruction of all withdrawn height safety equipment that cannot be satisfactorily repaired.

Falling objects

- A drop zone must be established and demarcated.
- Suitable steps must be taken to prevent any material or objects from falling which could cause harm to people or property.
- Where it is not reasonably practicable to comply with the requirements every employer must take suitable and sufficient steps to prevent any person from being struck by any falling material or object that is liable to cause personal injury.

- No material or object shall be thrown or tipped from height in circumstances where it is likely to cause injury to any person.
- Materials and objects must be stored in such a way as to prevent risk to any person arising from the collapse, overturning or unintended movement of such materials or objects.

SPECIFIC OUTCOME - 1/ AC6

COMPREHENSIVE RISK MANAGEMENT

A comprehensive risk assessment are based on comprehensive identification of specific risks within a framework of sources of hazards, and expected frequency of risk events, ranging from continuous to less than one event per century. The impact of climate disasters (e.g., floods, or storms), and Covid 19, should not be overlooked in developing a comprehensive risk assessment.

While the rising occurrence of extreme weather and other natural hazards can be addressed through emissions mitigation, the ability to recover quickly from setbacks needs to be enhanced by addressing vulnerability and the lack of sufficient assets to manage exposure.
The ability to recover quickly from setbacks does not mean that people don't experience stress, emotional upheaval, and suffering.

Comprehensive risk management to inform decision-making and action for set backs

As climate change worsens the frequency and intensity of extreme weather events around the globe, countries can no longer afford to deal with the consequences of natural shocks only after they have occurred. More often than not, the financial impact of natural hazards exceeds the costs of investments that could have been made to protect people beforehand. Accordingly, potential impacts need to be reduced as much as possible prior to the occurrence of extreme weather and other natural hazards, while also preparing to respond to the impacts which simply cannot be avoided.

Integrating adaptation, disaster risk reduction, management and response

Comprehensive Risk Management (CRM) responds to this need by integrating adaptation, disaster risk reduction, and disaster risk management. As such, it is both, a conceptual lens for identifying and planning activities, as well as an integrated set of actions that improves setbacks. CRM, therefore, brings together a wide array of stakeholders, to ensure effective and efficient use of knowledge and resources. Its building blocks consist of the phases of planning, preparing, and responding.

At the heart of Comprehensive Risk Management lies the prevention phase, for which Comprehensive Risk Assessment is key. It is only when the underlying root causes of vulnerability are properly identified, understood, and combined with exposure assessments that effective measures can be taken to build resilience These entail a broad portfolio of adaptation and risk reduction measures, and risk communication and awareness-raising. The residual risk, which cannot be addressed through adaptation and risk reduction, will then be managed as part of the retention and transfer, preparedness, and response phases.

In most cases, addressing residual risk as part of the retention and transfer phase requires implementing risk financing mechanisms alongside legislative interventions that allow these mechanisms to function.

Moving into the subsequent preparedness phase means leveraging risk assessments to anticipate potential impacts and taking actions instrumental in reducing the number of lives and resources lost. The phase is important, since thorough preparedness reduces the financial burden on the retention and transfer phase. Actions enhancing preparedness include both ‘preparing now‘, for example by setting up early warning systems, as well as putting in place response plans to be ready once an event strikes.

The response phase focuses on the period immediately after the occurrence of an extreme event and operationalizes measures supported through access to risk finance. These include immediate life-saving interventions as well as the short and medium-term provision of relief and supply services.

CRM, despite its focus on climate/related risks, can also provide important insights for other shock responses. Currently, the COVID-19 crisis demonstrates how human, social and economic characteristics like income and education determine the extent to which people suffer from the global pandemic.

Climate change is shown as driving a pro-poor adaptation agenda, which could allow current shortcomings in risk reduction to be overcome.

Findings suggest the opinion that disaster risk reduction has an ability to influence the ultimate quality of a construction project, ultimately the success of the project.

Keep Your Employees Safe

Since your employees work almost exclusively outdoors, the weather plays a large role in their daily working conditions. Sometimes, working in rainy or cold conditions is simply unavoidable,

so it is important that your employees are prepared and educated on handling the conditions safely. Inclement weather can also impact other responsibilities as an employer, so you need to be prepared as well.

Cold Weather Risks

Working in the extreme cold can be dangerous for employees, and rain and wind intensify that danger. OSHA has issued guidelines offering precautionary measures to prevent cold stress, which can lead to tissue damage, hypothermia, frostbite and trench foot — a painful condition of the feet caused by long immersion in cold water or mud and marked by blackening and death of surface tissue that can cause serious injury or death. Factors that contribute to cold stress are cold air temperatures, high velocity (speed) air movement, dampness of the air and contact with cold water or surfaces.

Safety in the Cold

There are several precautions that employees should take while working in cold or dangerous weather:

- Take breaks to get warm
- Drink plenty of liquids, but avoid caffeine
- Avoid smoking, which constricts blood flow to skin
- Be aware of any cold weather related side-effects that their medication may have
- Know and understand symptoms of cold-related illnesses and injuries
- Stretch before physical work to prevent muscle pulls and injuries
- Wear protective clothing when it does not interfere with personal protective gear and equipment:
- At least three layers: something close to the skin to wick moisture away, an insulation layer and an outer wind and waterproof layer
- Outer layers should be loose to allow ventilation and prevent overheating
- Hat or hood when not wearing a hard hat, or under the hard hat when necessary
- Insulated boots
- Gloves—not only can the cold cause injuries to exposed skin, but cold hands also make workers more prone to injury when handling machinery or other objects

(Note: In general, OSHA requires employers to pay only for protective gear that is out of the ordinary; employees are responsible for everyday clothing, defined as items that can, and regularly are, worn away from the workplace.)

Employee Training

Cold, rainy or snowy weather can cause unusual conditions and higher risks, so it is important to train employees on safety procedures. They should understand the dangers of exposed skin, insufficient protective wear and cold, wet or slippery equipment. Employees also should be trained to recognize and treat cold-weather illnesses and injuries.

Driving Company Vehicles

Another concern regarding inclement weather is employees who drive a company vehicle as part of their workday. Driving in severe weather can be extremely dangerous, so it is important to take precautions. All vehicles should be given a safety check before the bad weather hits, and they should also be equipped with emergency materials such as a blanket, first aid kit and flashlight.

In order to protect your company against liability, any employees who may drive in bad weather on company time, regardless of whether they drive a company or personal vehicle, should be trained in safe, cautious driving techniques and what to do in case of an accident.
All of these cold and inclement weather provisions should be included in your safety plan and discussed before and during the onset of such weather.

Communication Channels

Whether your employees come in to work on a given day may depend on the weather conditions. In uncertain weather conditions, you may not know until the night before or morning of if your employees will be working that day. As such, it is essential that you have communication channels in place to inform your employees, including a backup method if they cannot be reached on their phone.

Be Prepared

Before bad weather hits, you should be prepared, and your employees should be informed of all relevant safety rules and policies to keep in mind. If you are proactive in tackling bad

weather conditions, you can minimize the impact on your business and employees as much as possible.

Consequences for not conforming to Legal and specified requirements

Failure to adhere to legislative instruments will result in business closure until compliance is met. In some instances heavy fines are payable and criminal cases can be opened against the business owners.

Fines: being charged under the Occupational Safety and Health Act with fines, ranging between R50 000 to R100 000, and possible imprisonment of business owners.

- Loss of Reputation
- Loss of current or potential Staff
- Down time and Loss of Productivity
- Incidents and accidents;

Financial implications due to bigger amounts that must be paid to the compensation commissioner

SPECIFIC OUTCOME - 1/ AC7

TRAINING IN HAZARDS AND WORK PROCEDURES

Training is one of the most important components within the company's safety management system. It gives employees an opportunity to learn their jobs properly, bring new ideas into the workplace, reinforce existing ideas and practices, and it helps to put the Safety and Health Program into action.

Everyone in the company will benefit from safety and health training through fewer workplace injuries and illnesses, reduced stress, and higher morale. Productivity, profits, and competitiveness will increase as production costs per unit, turnover, and workers compensation rates lower.

Management commitment

Management will provide the necessary funds and scheduling time to ensure effective safety and health training is provided. This commitment will include paid work time for training and training in the language that the worker understands. Both management and employees will be involved in developing the program.

To most effectively carry out their safety responsibilities, all employees must understand their role in the program, the hazards and potential hazards that need to be prevented or controlled, and the ways to protect themselves and others.

Companies will achieve these goals by educate:

- Everyone on the consequences of their actions
- All managers, supervisors and employees on their safety management system responsibilities
- All employees about the specific hazards and control measures in their workplace

Training safety

Worker safety training is critical to ensuring your workplace is healthy, safe, and OSHA compliant. Every year, thousands of workers are injured or killed because of safety violations that could have been prevented with appropriate hazard training.

Every workplace is unique and presents unique and often changing hazards. The only way to keep your workers safe is to ensure they know how to identify when and where hazards occur, and the correct controls to activate for each hazard.

The Occupational Safety and Health Administration (OSHA) advise that every employer institute a safety and health program in compliance with their recommendations. This includes general awareness training; employer, manager, and supervisor training; worker role-based training; and hazard identification and controls training for workers.
Hazard identification training ensures that every employee understands the hazards they are likely to encounter in the course of their job, and how to identify each one. Controls training ensure that they know what to do when they encounter each hazard.

What to include in hazard identification and controls training program for workers. Hazard identification and controls training should enable employees both to identify the common hazards present at their work sites, as well as general principles for identifying hazards and addressing them.

Training should include:

- Techniques for identifying hazards
- Job Hazard Analysis
- How to recognize both hazards in their jobs as well as more generally in the workplace
- Concepts and techniques for controlling hazards
- The hierarchy of controls, and its importance
- Proper use of work practice and administrative controls
- When and how to wear personal protective equipment
- Which personal protective equipment is appropriate for each circumstance
- Any additional training that is necessary for operating machinery, equipment, processes, materials, or other aspects of the job
- Any new hazards that may be present when a worker moves to a new job or task

Instituting a worker safety training program is a simple and cost-effective way to improve safety on the job site or at your facility, reduce worker's compensation claims, and ensure better OSHA compliance. It's one of those things we recognize as critical. An employee

safety starts by covering key workplace safety topics that are applicable to almost every industry.

For many companies, there are seven key workplace safety topics you should add to your employee safety training program:

- Workplace ergonomics
- Fire safety
- Workplace violence prevention
- Employee health resources
- Environmental safety
- Equipment safety

Each of these employee safety training topics is an important part to keeping your employees safe. While these safety topics may not cover all the areas you need training for, they're a great start.

- **Workplace ergonomics**: Maybe your employees work in a cushy office with windows that don't open and climate controlled conditions. While it's true that the risks of injury while working in an office are dwarfed when compared to those working on an oil rig or a construction site, ergonomic workplace injuries can cost a company money in workman's compensation claims and loss of productivity.

  Teach employees how to lift, sit, and move throughout their day so you can be rewarded with fewer sick days, lowered healthcare costs, and happier employees. Find our full guide on creating effective ergonomics training here.

- **Ensure employees receive safety and health training:**

- Whenever a person is employed - general safety orientation including an overview of company safety rules, and why those rules must be followed.
- Whenever an employee is given a new job assignment. It's extremely important that supervisors emphasize safety during initial task assignment.
- Whenever new work procedures - supervisor on-the-job training.
- Whenever new equipment is installed - if new hazards are introduced.
- Whenever new substances are used - hazard communication program may apply.

- Whenever a new hazard is introduced to the employee.
- Employees must know they are responsible for complying with all company safety rules, and that most accidents will be prevented by their safe work practices. They must be very familiar with any personal protective equipment required for their jobs. They must know what to do in case of emergencies.
- Each employee needs to understand that they are not expected to start a new assignment until they have been properly trained. If a job appears to be unsafe, they will report the situation to their supervisor.

- **Supervisors**

Supervisors will be given training to help them in their leadership role.

They should be taught to look for hidden hazards in the work under their supervision, insist on the maintenance of the physical protection in their areas and reinforce employee hazard training through performance feedback and consistent enforcement when necessary.

Ensure supervisors understand the responsibilities below and the reasons for them:

- Detecting and correcting hazards in their work areas before they result in injuries or illnesses
- Providing physical resources and psychosocial support that promote safe work
- Providing performance feedback and effective recognition and discipline techniques
- Conducting on-the-job training

Supervisors are considered the primary safety trainers. All supervisors will complete training techniques and how to test employee knowledge and skills. They will also receive training on how to apply fair and consistent recognition and discipline.

- **Managers.**

All line managers must understand their responsibilities within our Safety and Health Program and should be trained in the following subject areas:

- the elements of the safety management system, and the positive impact the various processes within the system can have on corporate objectives
- their responsibility to communicate the Safety and Health Program goals and objectives to their employees

- their role that includes making clear assignments of Safety and Health Program responsibilities, providing authority and resources to carry out assigned tasks, and holding supervisors accountable
- Actively requiring compliance with mandatory Safety and Health Program policies and rules and encouraging employee involvement in discretionary safety activities such as making suggestions and participation in the safety committee.

Training will emphasize the importance of managers' visibly showing their commitment to the safety and health program. They will be expected to set a good example by scrupulously following all the safety and health rules themselves.

Safety orientation will emphasize that compliance with safety policies, procedures, and rules as outlined in the safety plan is a condition of employment. Discipline will be administered to help the employee increase desired behaviours, not to in any way punish. An explanation of the natural and system consequences of behaviour/performance should be addressed in every safety training session.

Each worker who will use a personal fall protective system shall be trained to be able to select, inspect, use, store and maintain the equipment according to the requirements of the procedure and the manufacturer’s recommendations.

The OHS Act and its Regulations require a number of appointments to be made according to the scope of work.

SPECIFIC OUTCOME - 2/ AC1

FALL ARREST AND FALL PREVENTION EQUIPMENT

Anytime you are tasked to keep someone safe from falling, one decision must be made first. Do I select a Passive System or Active System? Understanding the difference between passive and active fall protection is a great place to start.

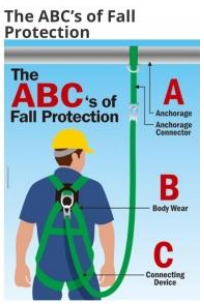
Examples of Fall Protection Systems

- Perimeter guardrails
- Safety net
- Safety monitors

- **Passive Systems**

A Passive System, in short, requires no human interaction to function properly once installed. It has no active mechanisms or moving parts. These tend to be your guardrails and netting. Netting will catch you regardless if you are paying attention or not. In other words, there is nothing for you to do to get passive systems to keep you safe.

- **Active Systems**



Active fall protection requires human interaction to keep one safe. This could be an:

- Anchor point
- Horizontal life line / vertical lifeline
- Overhead rigid rail, or anything that requires action from the worker to be safe

While working at heights, using an active system requires the worker to put on a full body safety harness, and then attach an acceptable lanyard to themselves, depending on their scenario. This could be anywhere from a shock absorbing lanyard to a self-retracting lifeline.
Now assuming that the active system was engineered structurally, up to date with its visual and annual inspections, adequately trained to workers and that a rescue plan is in place, you might be safe.
We know that there are times when passive systems are not possible. Active systems have their place in this industry. With the knowledge of these two options, you are better equipped to select the best system for your scenario.

Fall Protection Required

There are two starting points that, once reached, require fall protection. According to OSHA, these heights are:

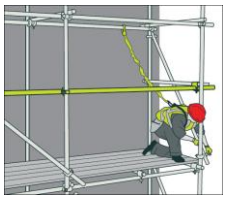
- General Industry requires fall protection for any worker over 1.2 m
- Construction requires fall protection for any worker over 1.8 m

This means that at any point your employees are exposed to heights equal to or greater than these, they must have some sort of protection to mitigate the risk of falling from height. If a fall safety solution such as railing is not a realistic option, personal protective equipment such as harnesses, lanyards, and lifelines are required.

The “No Minimum Height” Rule

There is an instance in which there is no minimum height. If your employees are working over dangerous equipment, machinery, or any hazard into which they could fall, they must have fall protection at all times or machine guarding needs to be put into place.

- **PERSONAL FALL ARREST SYSTEMS (PFASs) CONSIST OF:**



Anchorage

When a personal fall arrest system is used, these systems shall be tied-off properly to anchorage points, which are capable of supporting a static load of 5000 pounds (2268 kg) per person attached; or as part of a complete personal fall arrest system that maintains a safety factor of at least 2 and is operated under the supervision of a qualified person.

Acceptable anchor points shall be determined by one of the following methods:

- The anchor point installation follows manufacturers' specifications
- Engineering has documented approval of the anchor point.

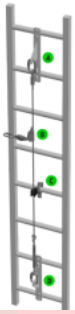
If a fall arrest has occurred; Engineering shall be contacted to inspect the anchor point for damage and/or corrective action. Anchor points are used to connect lanyards, lifelines, and other forms of tie-off which prevent a worker from falling.

Sound anchorages include: structural members, but **not** standpipes, vents, other piping systems and electrical conduit.

- **Body Harness —** Straps which may be secured to the body in a manner which will distribute fall arrest forces over the thighs, pelvis, waist, chest and shoulders, with a means to attach to other components of a PFAS**.**

Shock Absorbing Lanyards are made of webbing that is designed to stretch or rip open to limit impact forces onto fall victim's body. They often have two legs which can each be attached for 100% connection to your structure for each leg

A non-shock absorbing lanyard is only good for restraint. A lanyard needs a shock pack when it will be used for fall arrest. The shock pack helps absorb the kinetic energy that is created by a body in freefall.



Guided type fall arrester including a rigid anchor line

The vertical anchor system is designed to protect the user throughout the climbing or descending of a ladder. The anchor line consists of a stainless steel cable, intermediate anchors and terminal anchors. The gliding shuttle (fall arrester) will block the fall of the user immediately and will dissipate the shock generated by the fall, having an integrated energy absorber.

Self-Retracting Lifeline

The housing or casing is the part you see which is what the lifeline itself winds on to.

Used properly, like most fall protection, the SRL should be anchored at the height of your harness' D-ring or above. While some may hear "retractable" and think that the cable will pull you back if you begin to fall, this is not true. What is already played out will remain played out,

so if you anchor the SRL at your feet, you are adding fall distance that can place too much force on your body. The very idea of the short arrest distance of an SRL is to keep those forces at very low, very safe levels. Using an SRL on a sloped roof could also be a problem as a fall that involves the worker slipping down the slope may not reach a high enough speed to engage the mechanism. Ensure that your SRLs are always properly installed and being used in accordance with the manufacturer's instructions.

SPECIFIC OUTCOME – 2 / AC2, 3 & 5

RESCUE EQUIPMENT AND RESCUE TECHNIQUES

One of the most neglected aspects of Fall Protection is the rescue and retrieval plan. You have selected your harnesses and lanyards, debated the feasibility of railings, and calculated your fall distance, but what do you intend to do once the workers have fallen? While the worker is dangling from the structure is not the best time to develop a plan. The time is now, before work at heights begins.

Before using a fall arrest system consideration must be given as to what emergency rescue strategy will be employed to remove an affected employee. Depending on the location and height of the work this strategy may be as simple as the availability of a retrievable ladder or as complex as involving the local fire and rescue department's ladder trucks and elevated equipment. Prior to performing any work activity where personal fall protection equipment will be used, a written rescue plan must be developed by a Competent Person and reviewed with the Authorized employee.

The HSE requires that your rescue plan is properly planned, supervised and carried out by people who are right for the job. You can check if someone is suitable for this role by checking that they have sufficient skills and experience to perform rescue operations. This plan and the resources must be replenished and updated regularly to ensure the best possible equipment is on hand. We have a wide range of rescue kits available for these rescue plans.

- When making a Working at Height Rescue Plan, HSE also requires you think about these aspects:
- What will be the anchor point for the safety equipment?
- What type of weather could compromise worker safety?
- Will the rescuers be safe when carrying out the procedure?
- Is the equipment the individual was using no longer safe?
- How will the individual be attached to the rescue kit once they are reached?
- How will they be moved once the rescue team reaches them?

Once you have considered all these factors, a Working at Height Rescue Plan can be put in place and the workers can be notified of their

PPE during the fall

Everyone working at height needs to wear Personal Protective Equipment (PPE) and they need to be trained on how to use it safely as well. The specific PPE that you will use depends on your circumstances and the type of work at height that you do.

Where possible, work in fall restraint rather than fall arrest at all times: done properly, this will significantly reduce the risk of falls by stopping the worker reach dangerous areas in the first place.

However, fall restraint systems are not suitable for all work at height; in this case, fall arrest systems should be used, but extreme care needs to be taken when doing so. No one should ever use fall arrest systems without undergoing rigorous training.

At the same time - instead of hard hats, safety helmets (including a chin strap) are recommended for people who may be at significant risk of a fall.

Rescue procedure

Decide on a rescue system that will help you retrieve the fallen worker as soon as possible. Will the worker be able to perform a self-rescue or will he need to be assisted?

In dangerous situations, workers should always work in teams: if they work alone, it won't be possible for a rescue procedure to be carried out on time.

- Preparation is the key: make sure that there is a rescue kit at the point of work prior to the work commencing. If you fail to do this, there might not be enough time to collect if should someone fall. This will deem your rescue procedure unsuccessful.

- When a fall happens, another worker (who has been previously trained in rescue procedures and rescue equipment handling) needs to assess the situation and make contact with the fallen worker, determining his status. In the meantime, the emergency services will need to be contacted and the company alerted about the accident.

- The next step is to immediately implement the rescue procedure in accordance with the company policy and safety guidelines.

There are 4 types of rescue:

- Lowering a remote casualty
- Raising a remote casualty
- Self-evacuation by descent
- Rescue another in descent.

It is preferable that the rescuer does not descend and is not suspended while rescuing someone else, so that further complications are avoided. The rescuer should not endanger him when carrying out a rescue procedure.

Rescue training

Everyone involved in working at height and rescue procedures should be trained on fall protection, rescue equipment and procedures. The authorised rescuer must be trained by a competent rescuer trainer and then retrained should the nature of his work change, or if there are other changes in circumstances. He must also be evaluated by a competent trainer at least once annually.

The rescuer should be able to inspect, anchor, assemble and use fall protection and rescue equipment safely.

Training should include:

- Fall hazard recognition
- Fall hazard control methods
- Fall protection and rescue procedures
- Inspection of equipment and systems before use.

All training needs to be well documented; documents need to be archived for a number of years, depending on the situation.

Rescue equipment

Depending on the type of work that is carried out, as well as the height of the building or site specific circumstances, you might need to use rescue equipment as simple as a ladder or as complicated as a crane. In some situations, you may have to consider MEWPs (mobile elevating platforms), man-riding baskets for cranes or proprietary rescue systems.

Your rescue plan will need to include:

- Details of the equipment that you will use for the rescue
- Configuration of the equipment for different types of rescue
- Identification of anchor points where necessary
- Limitations of the rescue plan for adverse weather (wind, snow etc.)

Rescue kits allow you to either lower the person to the ground or lift them up, depending on the situation. As a building owner/employer, you are obliged to provide an anchorage point on the roof to help complete a rescue safely. If someone has fallen over an edge, you need to think of the additional friction encountered when trying to raise the fallen worker, the anchor line being at a risk of cutting and generally be aware of the edge interfering with the rescue equipment. In any case, make sure that the equipment that you will use for a rescue is properly serviced before being put to use. Do not use the equipment for purposes other than which it was intended. Whatever happens, make sure that there are other trained individuals on the ground that can assist with the rescue plan.

Emergency services: although you should not rely on them to perform the rescue, they will be able to assist, especially in cases of long term suspension, which can be very dangerous.

On-site or other medical services: brief them on the type of accident and potential injuries. The company, who will report the accident to HSE (Health & Safety Executive), and will then investigate the incident and take appropriate measures.

Prolonged suspension

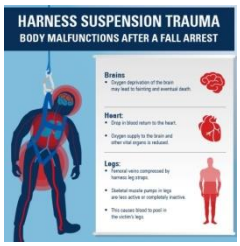
Prolonged suspension is a very serious matter and rescuers need to be able to spot the signs of syncope (sudden transient loss of consciousness with spontaneous recovery) as soon as possible.

Rescue equipment maintenance

You will need to store the rescue equipment in a suitable place and make sure that it is inspected periodically. You will also need to keep records of previous inspections, maintenance and equipment history.

Rescue equipment should be inspected at least once a year, although we recommend doing this more often.

Whatever plan you come up with needs to happen fast. Suspension Trauma – can occur in as little as 10-15 minutes and sometimes less, depending on a person's health and/or the nature of any injuries sustained in the fall. Rescue needs to begin immediately.



Suspension Trauma's symptoms include faintness, breathlessness, sweating, paleness, hot flashes, increased heart rate, nausea, dizziness, low heart rate, low blood pressure, and loss of vision. Factors that can affect the severity include inability to move the legs, pain, injuries during the fall, fatigue, dehydration, hypothermia, shock, cardiovascular or respiratory disease, and blood loss.

A Rescue Plan is not one size fits all

What works in one instance for fall rescue and retrieval will not necessarily work in the next instance. Rescue from a high-rise, for example, will be much different than rescue from the construction of a one or two story office building. And, not only will your plan need to be different from project to project, but it will also possibly need to be different from one phase of a job to the next. Perhaps when the steel is up, the sub-grade levels have been completed, and the area around the building has been back-filled and compacted, an aerial lift can be used for rescue, but what do you do while that mass excavation is still open? What if a large concrete pad is being poured right where you need to set up the lift?

Construction is dynamic – the environment is in a constant state of change. Because of this, your plan must be constantly reviewed. In certain general industry settings, you may be able to come up with one plan, insert it into your corporate health and safety program, train to it, and rest reasonably assured that you are covered. Your rescue and retrieval plan must be not only site-specific, but it must also be location, phase, and task specific while considering surrounding work activities.

Your victim may not be able to help

Products exist that help prolong the amount of time before Suspension Trauma sets in. For example, you may have a pack on your harness that can be deployed in the event of a fall which contains straps – or steps – into which you can place your feet to relieve the pressure on your legs. This is an excellent product but it relies on one very critical assumption – that your victim is conscious. Whether the straps are manually deployed or automatically deployed from the force of the fall, the victim will still need to be able to step into them.

Moreover, if you've got people working alone at heights, how do you know they've fallen? Can you see everywhere your workers are working? Is somebody on constant watch to make sure there's nobody hanging from a lanyard? The workers have phones or radios, but you cannot make a radio or phone call if you're unconscious. Nor can you make one if your radio or phone was dislodged in the fall, falling to the ground five stories below. Keep this in mind when developing your plan and, never allow anybody to work at heights by themselves.

Rescue equipment

Consider your particular circumstances, review available equipment, and devise your plan. . Employees must be trained and demonstrate the ability to do what is necessary. If you feel the rescue is beyond your abilities, speak to your local fire department to see if they are trained and if it's feasible for them to be on-site during the work. Obviously, this would most likely not be possible for an entire job, but perhaps it would be for one particularly difficult task. If the local fire department isn't trained, there are private entities capable of rescue at heights.

Hierarchy of controls

Should you not be able to eliminate every fall hazard, maybe there are ways to eliminate the hazard during certain tasks. Look at the possibility of rails instead of fall arrest. Consider a retractable lanyard instead of a lanyard with a deceleration device or a travel restraint so that your personnel cannot reach the edge. If you can eliminate the fall, you can eliminate the need for rescue and retrieval. If you eliminate the need for rescue, you've eliminated the possibility of Suspension Trauma.

We are forced to face the realities of this world and those realities are that falls still remain the number one killer in construction and the fatalities are not always caused by the fall itself, but

are sometimes caused by the aftershock. Those working at heights need to be prepared and need to act fast so that a would-be rescued worker does not become another statistic.

Here are some rescue equipment to consider when developing the rescue and retrieval plan:

- **Confined Space Rescue and Retrieval**

Confined space equipment allows the worker to be tied off and safety connected when working underground or in difficult to access areas. Tripods work well as tie-off points when the worker will not need to be suspended at any point.

The Workman Tripod is ideal for performing rescue work, and helps to make a vertical descent easy. This rescue tripod has an internal leg-locking mechanism; maximum height indicator on the tripod legs; cut-resistant leg pin retention chains; and recessed product labels. Its reduced weight and integral carrying strap facilitate easy transport.

- **Fall arrest rescue kit with Gear Rescue Ratchet**

This is used in rescues to lift a worker just enough to disconnect his/her fall-arrest system, so that he/she can be lowered with the use of the rescue equipment in a kit to a safe place or platform

It consists of a:

- Rescue Ratchet
- Antipode Static Rope at selected length

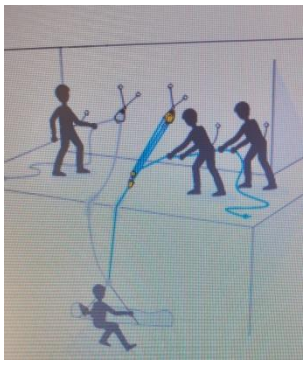
- 4 x Oval-Shaped Connectors
- Singing Rock Eye Sling 150cm
- Retractable Pole
- 1 x Singing Rock HMS Auto-Locking Connector

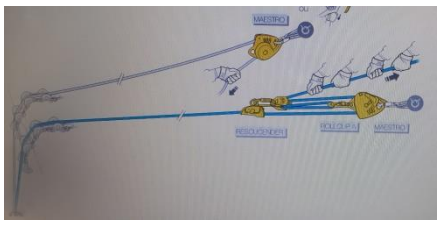
The Rescue Ladder is specially designed to facilitate the rescue of fallen workers at significant heights, and is thus particularly applicable for the wind energy industry. This durable ladder system is manufactured with unique ladder standoffs to make footholds easier and self-rescue more likely. The Rescue Ladder can be deployed within seconds to rescue the victim from fall.

Hauling with work rope and secure rope

All manoeuvres must be done on two independent rope systems. These two systems can work in parallel (two haul lines) or separately (work rope and secure rope)

All hauling and positioning forces are concentrated on the work rope. The belay rope is set up and kept taut enough to hold the load in the event of anchor or work rope failure.





Advantages

Quick and simple setup, only one mechanical-advantage system needed. Two different systems may be used, for example a mechanical haul system (winch). Configuration suited to small work spaces.

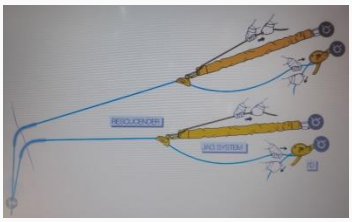
Disadvantages

If the work rope breaks, the clearance needed can be significant when the secure rope comes under load.

Warning: this system must be fully operational at all times. Risk of the rope path shifting and of unforeseen abrasion on the secure rope as it comes under load following a work rope failure.

HAULING WITH TWIN TENSIONED HAUL LINES

The two ropes have the same function and work in parallel: each rope supports half the load.



Advantages

With good coordination, it's possible to haul a heavy load even with simple pulley systems. If one rope breaks, the other is already tensioned to hold the load, reducing the amount of clearance required. It is possible to manage a complex litter route if the rope paths are anticipated.

Disadvantages

Load sharing between the two ropes is never perfect; sometimes one rope holds the entire load; good coordination of team members is required.

RESCUES USING CABLEWAYS

Cableway systems have uses in virtually every area of rope access and rescue.

When a cableway is tensioned between two anchorages and any kind of load placed on the system, relatively high forces are placed on the anchors compared to conventional rope rigging. The greater the tension applied to the cableway (i.e. the wider the angle), the heftier the forces. There is a 'magic angle' of 120 degrees on the part of the cableway; here the force applied to the mid-point is equalled by that placed on the anchors; any wider angle of cableway will begin to create anchorage forces out of all proportion to the humble load exerted at its mid-point.

You have to calculate the forces and create a suitably robust system, tension cableways as little as possible. (With a load-cell in controlled conditions the weight of 2 persons will tend to put about 3.5kN force on the anchors of a conventionally tensioned -1 person on a 3.1 pulley-cableway)

SPECIFIC OUTCOME – 2 / AC4

SHOCK LOADS, FALL FACTORS AND ANCHOR LOADS

The terms "shock loads, "fall factors" and anchor loads are explained

- **Shock loading**

Shock loading occurs when a load is quickly jerked in any direction or if it is allowed to free-fall before the rigging catches it. Rapid acceleration increases the force put on the rigging system, and if the acceleration is too severe, it can overload the capacity of the system.

When shock loading occurs, although the load itself may be within the load-bearing capabilities, the forces generated by the shock loading can momentarily increase the load beyond the ratings. This can damage certain units and permanently affect performance and durability.

Anchorages to which personal fall arrest equipment is attached shall be capable of supporting at least 5,000 pounds (22.2 kN) per employee attached, or shall be designed, installed, and used as part of a complete personal fall arrest system which maintains a safety factor of at least two, under the supervision of an engineer.

- **Fall factor**

The fall factor is simply the distance fallen, divided by the amount of rope available to absorb that fall. The principle is that, the lower the fall factor, the safer the fall.

The fall factor is the ratio between the height of the fall and the length of rope that is available to absorb that fall. The value of the fall factor varies between 0 and 2 and is calculated by dividing the height of the fall by the length of the rope. The height of a fall is measured from the point where a person falls to the point that the fall is stopped.

The lower the value of the fall factor, the less impact forces are applied to the body of the person and the 'safer' the fall. On the other hand, the higher the value, the greater the impact forces on the body will be and the more likely it is that serious injuries are sustained. Note that the fall factor is a way to indicate the severity of a fall, not an exact way to measure impact forces.

To get a better picture of what fall factor is and how it's calculated, we will provide some basic examples below, based on climbing images. As mentioned in the paragraph above, the fall factor is calculated following the equation:

$$\textbf{Fall factor} = \frac{\text{Height of the fall}}{\text{Length of the rope}}$$

Note that factors like elasticity of the rope and hitting objects are taken out of the equation.

Example 1

The anchor point of the climber is placed overhead and the rope is pulled tight during the climb. In the example, the rope length is 2 meters. When the climber loses grip and falls, the fall distance is 0 because of the taut rope. This results in the following equation:

$$\frac{\text{0 meters fall height}}{\text{2 meters of rope}} = \text{Fall factor 0}$$

In this case, the impact force on the user's body is minimal, which is a safe value for the climber. The person would sustain some bruises in most cases.

Example 2

In this example, the total rope length is 2 meters as well. But now, the person climbs higher up to the same height as the anchor point. If the climber should fall, the distance of that fall will be 2 meters

$$\frac{\text{2 meters fall height}}{\text{2 meters of rope}} = \text{Fall factor 1}$$

A fall factor of 1 is reached here, which means that impact forces come into play that can possibly injure the climber, like breakage of limbs or a concussion.

Example 3

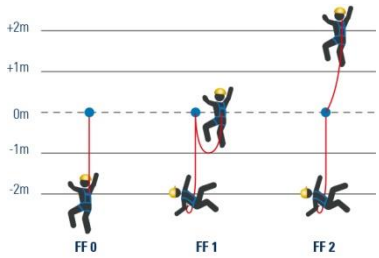
The highest amount of force that is released on the climbers' body is reached when the climber climbs to 2 meters above the anchor point with a rope of 2 meters.

In case of a fall, the climber will fall a total of 4 meters, resulting in the maximum fall factor:

4 meters fall height
----------= Fall factor 2
2 meters of rope

The impact forces on the body are dangerously high when a fall factor of 2 is reached and the climber will sustain serious and possible life threatening injuries because of it.

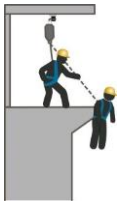
In the table below, you find a schematic overview of the fall factors as described above:



Fall factor and fall protection systems

In practice, the examples given in the previous section aren't representative for occupational situations where work at height is performed and fall protection is needed. In this section, we will put the examples into practice.

Fall factor 0



Example with an overhead fall protection system

When workers need to work at height and a ceiling or another structural element is located above them, the use of an overhead fall protection system is recommended. Especially in combination with an automatic fall arrest device (also known as a retractable device). This retractable device acts like a seatbelt: it keeps the lanyard taut at all times and will block immediately when a sudden acceleration occurs (a fall).

The image shows that the fall distance is very minimal. Only the extension of the energy absorber will add to the fall height (in case a retractable device has a built-in energy absorber,

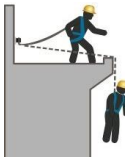
the rope will not extend). The lanyard will be the length of the distance between the attachment point on the harness and the anchor point, which is a horizontal lifeline in most cases.

If we do a basic calculation with the anchor point 1 meter above the attachment point of the harness, the fall factor would be:

0.75 meters fall height
----------= Fall factor 0.75
1 meters of rope

Fall factor 1

Example with a wall-mounted lifeline system



If the anchor point is located at waist height and the attachment point of the lanyard is located at the back of the worker, the fall factor will be around 1.

In the example, an overhead system is not possible, so the anchor point (a horizontal lifeline) is mounted at waist height on a wall.

In this situation, the lanyard is 2 meters. When a fall occurs, the user will fall approximately 2 meters as well. The protruding working area will somewhat decrease the fall distance, but the deflection of the lifeline will add to that again.

2 meters fall height
----------= Fall factor 1
2 meters of rope

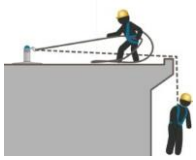
The impact forces will be quite high in this situation, that's why a personal energy absorber (PEA) needs to be used, which decreases the forces and decreases the chance of (serious) injuries caused due to those forces.

Fall factor 2

Example with a horizontal lifeline system

Horizontal lifeline systems and other systems where the anchor points are located at foot level are generally installed on roofs. When a user falls, they fall the distance of the attachment point to the height of the anchor point (2 meters) and the distance of the lanyard below the anchor point (2 meters).

In the example, this means a fall distance of approximately 4 meters. When putting this into the equation, we get a fall factor of 2



4 meters fall height
----------= Fall factor 2
2 meters of rope

The impact forces that are released on the body will be very high. That's why a personal energy absorber has to be used in these systems. This will add to the fall height by 0, 75 meter but it will significantly reduce the impact forces and decrease the risk of serious injuries.

The examples given do not entirely cover real life situations, because elements like rope flexibility, use of an energy absorber, deflection of the wire rope, distance of the anchor point to the roof edge etc. will have impact on the impact forces as well. Also, the distance to the next level below the working area is not determined (fall clearance).

Nevertheless, keeping the above in mind will help in choosing the most appropriate configuration for your fall protection system: whenever possible, strive to minimize the fall factor to 0.

Anchor loads

When eyenuts are used for fall protection they must comply with the relevant testing loads and procedures contained in the various standards.
Persons that select install and test eyenuts and structural anchors must be competent to perform that work. Suitable training programmes are recognised by the Institute for Work at Height (IWH)

Do other forms of training or registration make a person competent?

The short answer is NO.

To be competent in anchor point selection you should have received proper anchor point training which addresses at least the following topics:

- Reaction loads and direction of applied loads
- Test loads as per the standards
- In-service loads
- Resultant forces
- Combined Shear and Tensile forces and limitations
- Bending moments and bending stress
- Allowable stress in anchor bolts / size/ mechanical grade.
- Supporting structures /substrates/
- Load testing vs pull-out testing
- Minimum anchor size and embedded depth
- Minimum edge distances and anchor spacing
- The training programmes recognised by the IWH covers anchor points for fall prevention and fall arrest for use by one person only.

Any requirement or installation of anchors that exceed the criteria of type “A” anchor devices shall only be done after the design of such systems have been undertaken / approved by competent engineering professionals.

Cast Eyenuts

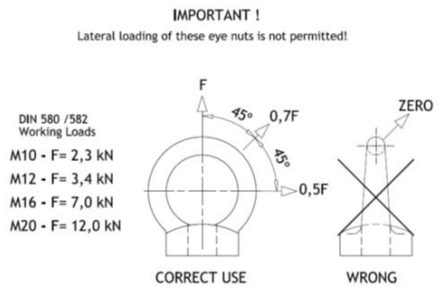
All anchor points (also known as “hangers”) need to be pulled up tight against a hard, load bearing surface such as normal concrete. Plaster covering (aka “rendering”) over a concrete surface is not hard nor is it load bearing. An anchor point fitted up against such plaster will cause the bolt to bend during a fall arrest situation. So, the correct installation requires that all

the “soft” materials (plaster and non-load bearing waterproofing) be removed between the contact surface of the eyenuts and the concrete.

Of critical importance is the correct orientation of the eyenuts to ensure that it is not subjected to what is known as “cross-loading” or “lateral loading”. Eyenuts can only take their full rated load in a direction that is in line with the anchor bolt i.e. pure axial loading.
A reduced load can be applied along the perimeter of the ring but only in a direction that is in-line with the shape of the ring of the eyenuts. If the eyenuts is positioned so that the ring is in a vertical orientation, then the load on the eyenuts needs to also be in that vertical direction.

The reduction in the safe working load is significant. The allowable load at right-angles (90 degrees) to the direction of the anchor bolt is only half of the safe working load stamped on the eyenuts.

“Cross loading” or “Lateral loading” is a situation where the load is not applied radially along the curvature of the ring part of the eyenuts. This load is applied onto the side of the ring and is not permitted by the manufacturers.



Eye nut loading limitations. Lateral loads are prohibited

The importance of load direction

Once an anchor is chemically set into the concrete structure it can no longer be turned and when the eyenuts is then tightened onto the threads of the anchor, the chances of the orientation of the eyenuts lining up in exactly the right direction of the applied load is almost nil.

When you tighten the eyenuts, the ring must end up exactly in that direction! What are the chances of that happening? And if you then unwind the eyenut to get the orientation right, then the nut is loose and does not press tightly against the concrete. The anchor bolt can now bend

under fall arrest loads and the nut might work itself completely loose with fatal results in a fall arrest or fall prevention situation.

Fitting normal sized flat washers between the eyenuts and the concrete structure is also not the best solution as the outer diameter of standard washers is smaller than the diameter of the base of the eyenuts thus leaving the anchor bolt unsupported and exposed to bending forces.

The vast majority of existing eyenuts installations use M12 anchor bolts. Look at the working loads for the top-of-the-range, high quality DIN standard eyenuts as listed in Figure 1 above. An M12 DIN 582 eyenuts is limited to 340kG axial load. All fall arrest anchor devices should have a minimum working load capacity of 600kg so M12 eyenuts cannot be safely specified for fall arrest use.

IMPORTANT NOTE:

The use of anchors set into brick walls, precast concrete block walls or materials other than in-situ cast concrete is beyond to scope of competency envisaged in the above-mentioned course and must be avoided. South African face bricks are not cast as solid units and have holes through them which make them unsuitable as structural substrates (base materials) for fall arrest anchors.

In all cases where the base material is anything other than grade C20/25 in-situ cast concrete, you should refer the matter to a professional engineer that has experience in this field.

Single Point Anchor Fall Protection Design Considerations Non-engineered single point anchors must be rated at 5,000 kg (2.3 ton) for one user or 4.6 ton for two users. Engineered systems must be designed for 2 x the applied load in the event of a fall by a qualified person.

SPECIFIC OUTCOME – 2 / AC6

PROCEDURE FOR FALL ARREST EQUIPMENT:

INSPECTION MAINTENANCE AND TESTING

Health and safety concern requirements, full body harness inspection is necessary part that needs to compliance, full body harness is the equipment that used for the safety purpose, for the maintain safety in the company, some high risk area like working on height, areas that unbalance and possibility of the fall down are very strictly required the safety equipment.

Fall Protection slings are conveniently produced from a lightweight material to make climbs easy, they are powerfully stitched fabric that is highly resistant to sunlight, water and other chemicals that may cause degradation. They are designed to provide workers with strong grip support and most slings are adjustable, ensuring comfort and safety.

Annual Recertification & Testing: Legislation dictates that fall protection equipment must be inspected and certified annually by an accredited person/company for recertification. Testing periods must be no greater than 12 months.

All the safety equipment needs to be inspected to ensure all the equipment are reliable to perform task at high risk area. Workers need to follow these steps as part of the routine to ensure that harnesses and lanyards offer optimal protection:

- All harnesses, lanyards and slings must be inspected before use. Users need to check and ensure that all labels, harness serial numbers, inspection and withdrawal dates are legible. It is also important to check that the safety standard certification mark is visible.

- Inspect the harness and lanyard webbing for any cuts, tears, holes, excessive stretching or abrasion damage. Depending on the type of industry, harnesses can be exposed to heat, corrosives and even hardware, which can compromise the integrity of the webbing.
- Examine all the harness and lanyard hardware and check for corrosion, deformation or excessive movement. Buckle adjusters, D-rings, and Snap Hooks should be free from dirt and damage. If any of the hardware exhibits excessive wear and tear – replace it immediately.
- Ropes should be checked for cuts, abrasion or fraying, as well as cracked or broken thimbles. If damage to the rope is visible, remove the rope from service and document.
- Inspect all the sewing on the harness and lanyard to ensure that there are no broken, cut or worn threads. It is also important to look out for any damaged or weakened threads as a result of damage through exposure or deterioration. If there are any visible unauthorised repairs, remove the equipment from service immediately.

Basic care of the safety equipment will not only prolong its durable life, but will also contribute towards the performance of its vital safety functions. Proper storage and maintenance after use are just as important as cleaning the equipment of dirt, corrosives and contaminants. The most effective way of cleaning a harness or lanyard is to first wipe the surface with a damp sponge, before working up a lather using a mild solution of water and dishwashing liquid. Rinse the equipment in lukewarm water, and hang feely to dry away from excessive heat.
To avoid unnecessary damage and deterioration to harness and lanyards as a result of exposure to heat, corrosive or sharp edges, as well as UV or other factors. If there is any doubt about the ability of a piece of equipment to perform accordingly, it is to be removed from service.

Example – See Annexure F

Tagging System

Every harness must have a legible tag identifying the harness, model, and date of manufacture, name of manufacturer, limitations and warnings.

- Check tag for date of manufacture and remove from service if past adopted service life policy

- If tagging system is missing or not legible remove harness from service.

Cleaning and Storage

Wipe off all surface dirt with a sponge dampened in plain water. Squeeze the sponge dry. Dip the sponge in a mild solution of water and mild detergent. Work up a thick lather, with a vigorous back and forth motion. Then wipe dry with a clean cloth.

Hang freely to dry, but away from excessive heat, steam or long periods of sunlight.

Storage areas should be clean, dry and free of exposure to fumes, heat, direct ultra violet light, sunlight and corrosive elements.

Note: Do not store harnesses next to batteries, chemical attack can occur if battery leaks.

Example: See Annexure G

SPECIFIC OUTCOME – 3 / AC1

FALL PROTECTION PLAN

A Fall Protection Plan (FPP) is a documented plan to work at a fall risk. The Construction Regulations of 2014 define a fall protection plan:

“fall protection plan” means a documented plan, which includes and provides for-

(a) All risks relating to working from a fall risk position, considering the nature of work undertaken;

(b) The procedures and methods to be applied in order to eliminate the risk of falling; and

(c) a rescue plan and procedures;

“**fall risk**” means any potential exposure to fall either from, off or into;

When developing a fall protection plan, the first step will be to draft a method statement. In the method statement, you identify the method of access- ladders, scaffolding, MEWP or rope access. From there you can identify the type of equipment needed such as harness, and what type of harness. Lifelines, descending devices, ascending devices etc. Look carefully at the OEM (original equipment manufacturer) specifications of the equipment as well as the SANS standards.

Now you can identify what method will be used, will it be fall arrest or rope access. And what type of training is necessary for the employees.

There is no such thing as a one fit all fall protection plan. Each site will differ and the fall protection plan must be in line with your scope of work.

For practical purposes, you could break down your fall protection planning into ten sections, with each section responding to a component towards compliance with Construction Regulation 10,

These sections relate to your Fall Protection Policy; Work Site and Job Conditions; Fall Risk Assessment; Legal Appointments; Training Management; Health Management; Equipment Management; Operating Procedures; Emergency Procedures; Review and Amendments.

1. Fall Protection Policy

Your policy should include a statement on how the employer will meet statutory requirements, such as the OHS Act, national or international standards (SANS, ISO, etc.), industry standards (professional body, such as the Institute for Work at Height), and corporate standards.

2. Work at Height Site Information

Gather and collate relevant information on the site; who, what, when, where, how. Part of the information gathering process includes:

- Notification of Construction Work in terms of CR4.1 (b), submitted to DOL seven days prior to commencement of construction work
- Contact Information of relevant management staff, contractors, and emergency services
- Work site location/s, address, GPS coordinates, road and site access points
- Method statement, with a description of the site, project phases, jobs, access methods and equipment requirements. What fall arrest or rope access equipment will be used, how you would gain access, scaffolding positions and methods, equipment applications.

3. Fall Risk Assessment

A detailed baseline risk assessment must be performed by a competent person (CR9.1 and CR10.2 a), including;

- Identify hazards and risks (including training and behaviour) to which your employees may be exposed
- Analyse and evaluate the risks and hazards
- Document your plan and work procedures to remove, reduce and manage the risks and hazards.
- The risk assessment must be communicated to all employees by the competent risk assessor or fall protection planner. Risk assessments must be monitored and reviewed in response to significant changes in plan, equipment, or staff.

4. Legal Appointments

Appointments required by the OHS Act, relevant to work at height, including:

- Fall Protection Planner CR 10.1 (a)
- Risk Assessor CR9.1

- Rescuer CR10.2 (e)
- Equipment Controller CR10.2 (d)
- Rope Access Technician CR18.7
- Fall Arrest Technician CR10.2 and 10.4 (b)
- Rope Access Supervisor CR18, 1.

Appointees must be competent in terms of the definition of a competent person in the Construction Regulations.

5. Training Management

The applicable training must be identified per designation, and appointment letters must state the required training. Records of training must be kept and identified on a training matrix.

6. Health Management

Relevant employees must have a valid medical fitness certificate. A medical fitness register must be kept with details and expiry dates of the medical certificates.

7. Work at Height Equipment Management

According to CR10.2 (d) and 10.4 (c)(i), there must be a procedure for inspection, testing and maintenance of all each kind of fall protection equipment.

Equipment Inventory for different types of equipment, with unique numbering, quantity and status. Inventory records must be kept at the equipment storage.

- Booking-in and booking-out documents by the equipment controller, with copies at the stores as well as in the fall protection plan file.
- Inspection records for intervals not exceeding 3 months of all equipment on the inventory list, kept at the stores.
- Pre-use inspection records by users, with records on file.
- Defective equipment reported to the appointed person (CR8, 7), who reports to the Equipment Controller. Replace defective equipment and amend the inventory list.

8. Work at Height Operating Procedures

Refer to training manuals, equipment instructions, manufacturer's recommendations, industry best practices, company procedures, client specifications, as well as your operating procedure.

9. Height Emergency Procedures

A site specific rescue plan should include:

- Standard or specific fall arrest rescue procedures, and responsible people;
- Standard or specific rope access rescue procedures, and responsible people;
- First aid procedures;
- Emergency services contact details and the kind of information they require;
- Incident reporting procedures and document formats (Annexure 1 and WCL2).

10. Fall Protection Review

Include a review process to follow if there is any:

- Change in work site
- Change in employees or contractors
- Change in scope of work
- Incidents
- Change in legislation or periodic review.
- A review register must be kept and changes to the plan must be recorded.

Example **See Annexure H**

Site-specific Fall Protection Plan

Planning plays a key role in protecting workers from fall hazards. This fall protection plan template can assist the planning process. Employers should ensure that fall protection plans are designed to address site-specific conditions and comply with Safety Acts and Occupational Health and Safety Regulations.

Company Project Name:……

Site Address:……..

Start date/Duration:……..

Work Description/Location:…….

Supervisor in Charge:……

Form Completed by:…….

Are records of approved Working at Heights training up-to-date and readily available?

Yes …….. **No**……..

NOTES:

1. Form is to be completed by a supervisor or worker who has taken approved WAH training.
2. Keep form on site as a record of site-specific training.
3. All workers to inspect PPE.

Step 1: Identify the site-specific fall hazards and controls.

Hazard(s)	Description	Control	Initial
Collapse of ground	Collapse of ground in rear of main building	• Indicate precautionary zone • Safe working platform • PPE - harnesses and • & lanyards	AB
Working at height (Inc. Falling persons' Objects)	Excavations in progress in southern side of main bldg. Beware of falling Objects	Scaffold handover certificate requires Edge protection Fall arrest equipment	AB

Step 2: Identify changes in the workplace.

If the Fall Protection Work Plan was developed beforehand, inspect the work location again and look for any new hazards related to the work currently being done.

Do any new hazards exist **Yes**……. **No**……**X**…….. **Initial**……**AB**……

If yes, list the controls for these new hazards and review it with workers.

Hazard(s)	Description	Control	Initial

Step 3: Try to eliminate the fall hazard.

	Yes	No
Can the work be relocated to a place where a fall hazard does not exist Can a guardrail system be used? If Yes, consider the following: Does the guardrail meet the strength requirements Is the guardrail no more than 30 cm from the edge being protected? Has it been installed according to the manufacturer's recommendations? If made of wood, can the guardrail resist all loads that it may be subjected to? **Can floor or roof openings be covered? If Yes, consider the following:** Does the cover meet the strength requirements Is the cover securely fastened? Is the cover adequately identified as a cover?		
Can an elevated work platform (EWP) be used? If Yes, consider the following: Is the EWP located on a level surface? Is the surface able to support the EWP and its load? Has the worker on it received fall protection training and been trained on		

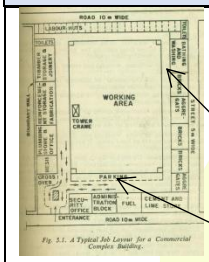
this specific EWP? Is there a worker on the ground who is able to lower the EWP in case of an emergency?		
Can a travel restraint system be used? If Yes, consider the following: Does the system meet the requirements Does the anchor point meet the requirements Is the equipment certified Is the travel restraint system set up to prevent the worker from reaching the fall Hazard? If not, a fall arrest system may be needed. Have other fall hazards in the area been considered? If not, a fall arrest system may be needed. Has the equipment and system been inspected before use, as per the manufacturer's instructions?		
Can scaffolding or pump jacks be used		

Step 4:	**Take steps to control the fall hazard.**

Can a fall arrest system be used? If Yes, consider the following: Is an emergency plan in place to rescue a suspended worker whose fall has been arrested? Has the worker been trained in fall protection and the specific fall arrest system being used Does the fall arrest system meet the requirements Does the anchor point meet the requirements Is the anchor point located so that the lifeline is close to a 90° angle from the edge Is the fall arrest system set up to prevent the worker from hitting an object below Have other fall hazards in the work area been considered Has the fall arrest equipment been certified Has the fall arrest equipment and system been inspected before use, as per the manufacturer's instructions and requirements If using a horizontal lifeline system, has it been designed by a professional engineer and installed according to the engineer's requirements		
Can a safety net be used? If Yes, consider the following: Is an emergency plan in place to rescue a suspended worker whose fall has been arrested? Does the safety net meet the requirements Has the safety nets been installed according to the manufacturer's instructions		

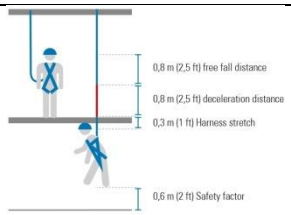
Has the safety nets been inspected according to the manufacturer's instructions		
Is a ladder being used? If Yes, consider the following: Has a risk assessment been done? (See Ladder Risk Assessment Checklist) Are the requirements of Ladder Use in Construction Guideline being met		
Can any other steps to control the fall hazards be used? If Yes, describe them below: 		

Step 5:	**Make a diagram of the location of each fall hazard and include any relevant details.**



Collapse of ground
Working at height (Inc. Falling persons' Objects)

Step 6:	**Calculate the fall clearance distance.**



Free fall distance = 0, 8 meter *(2 meters lanyard – 1,2 meter distance between D-ring and anchor point*

Step 7:	**Describe the system setup or work procedures.**

See Example 2: SAFE WORK PROCEDURE 021 - WORKING AT HEIGHTS - MAY 2021 DOC.12345/12/2021]

Step 8:	**Create a fall emergency plan to rescue a suspended worker whose fall has been arrested (one for each location if required).**

The Rescue Ladder is specially designed to facilitate the rescue of fallen workers at significant heights, and is thus particularly applicable for the wind energy industry. This durable ladder system is manufactured with unique ladder standoffs to make footholds easier and self-rescue more likely. The Rescue Ladder can be deployed within seconds to rescue the victim from fall.

Rescue Equipment	**Rescue Ladder**	
Equipment Inspection Date		
Roles of Rescuers		
Rescuers' Names		
Rescuers' Signatures		
Has the plan been practiced?	**Yes**……. **No**…….	**Drill date:**……

Step 9:	**Approvals**

Prepared by:		**Date Prepared**	
Approved by:		**Date Approved**	

Step 10:	**Get worker sign-off.**

Workers need to acknowledge that they have read the requirements and understand their responsibilities under the Fall Protection Work Plan.

Print Name	Signature

SPECIFIC OUTCOME – 3 / AC2

MAINTENANCE AND DISTRIBUTION OF A FALL PROTECTION PLAN

Whether you've developed Fall Protection Plan, an employee handbook, a policy manual, or some other form of documentation of your company's policies, it is crucial to communicate the contents of these documents to your employees. Your employees should be advised why it was created, what the purpose is and how the document will be used in the company. This also applies when updates are being made.

You should also incorporate employee feedback, opinions and ideas about what to include in the document, preferably prior to its creation. Asking employees up-front for their input about what they would like to see included is the first step to communicating company policies and procedures. Communication with employees should start well before the formal document is completed.

Develop your communication strategy first, before you start documenting the company's Fall Protection Plan. It is important to keep employees informed of the process to encourage their buy-in and input.

Keep the following recommendations in mind for how to communicate the Fall Protection Plan to the employees:

1. Inform employees up-front

- At the start of a project, let employees know that the company will work on developing (or updating) the Fall Protection Plan.
- Explain why the information is important and relevant, and what impact it will have on them.

2. Ask for feedback

- To encourage employee involvement, ask employees for their valued input about what should be included in the Fall Protection Plan.
- Incorporate as much of the employee feedback as possible.

3. Introduce final product

- Conduct a meeting with all workers to introduce the completed Fall Protection Plan and review its purpose.
- Reinforce its importance and how it should be used.

4. Request employee sign-off

- It is important for workers to read the document to become familiar with the company's Fall Protection Plan.
- Request each employee sign-off on having read the document.
- A copy of the sign-off should be placed in the Health and Safety System file.

The Fall Protection Plan should be reviewed, maintained and updated regularly – about once a year – and should incorporate any employee suggestions for improving the document. Following these recommendations, you'll be well on your way to communicate your policies and procedures to staff effectively.

SPECIFIC OUTCOME – 3 / AC3

REQUIREMENTS OF THE OHSACT AND CONSTRUCTION REGULATIONS

Working on heights is traditionally labelled or classified as a high risk activity. Incident records include numerous accounts of workers killed in falls from ladders. Serious head injuries and broken bones are frequent outcomes from ladder mishaps. Many electrocution deaths are caused by ladders that accidentally make contact with electrical sources like high power lines.

What is meant by ‘‘working on heights’’? How high is a height? From what height should a ladder or scaffolds be used? What are the requirements set for ladders? Let’s turn our attention to ‘‘General Safety Regulation 6’’ of the Occupational Health and Safety Act (Act 85 of 1993). This regulation deals with ‘‘work in elevated positions’’ anything off ground should be considered as a height or elevated position.

According to the Occupational Health and Safety Act the Employer will provide a competent person for doing the work. According to the construction regulation every work site must have a fall protection plan that will cover training for working at heights, equipment for working at heights and rescue procedures for working at heights.

A safe working at heights system consists of:

- A fall protection plan
- A fall arrest system for all working at heights.
- A rope access system for all working at heights.
- Equipment that is certified and inspected.
- Safe anchor points and safe anchor lines.
- Training provided to prove competence for working at heights.
- Rescue equipment
- Rescue plans

When we look at construction work you will find that ‘‘Construction Regulation 4(b)’’ stipulates that no person may work in an elevated position, unless such work is performed safely as if

working from a scaffold or ladder. It is clear from the above mentioned regulation that a ladder must be used for this purpose. This prescription applies from the office environment to more hazardous workplaces like construction sites. Ladders and scaffolds are basically used when you can't reach the work above you safely from the ground or from a solid structure. Please note that these devices are meant as temporary work platforms.

SPECIFIC OUTCOME – 3 / AC4

FALL PROTECTION VS FALL ARREST

All-protection systems play an important role in protecting employees from injuries due to a fall. There are many different types of systems, including guardrails, travel restraint systems, fall-arrest systems and the use of warning lines and safety monitors. Falls can happen from ladders, permanent structures like roofs, and temporary structures such as scaffolds and other types of work platforms.

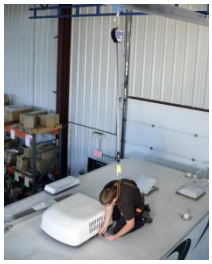
Fall protection is also required when working from:

- Elevating work platforms,
- Fixed suspended work platforms,
- Boatswain's chairs,
- Suspended equipment,

The best forms of fall-protection systems are those that prevent employees from falling and include guardrails (passive system) and travel restraint (active system).

Fall Arrest System

A fall arrest safety system typically includes an anchor point or series of anchor points, a safety lanyard or self-retracting lifeline, and a harness. This system must be designed to "arrest" or stop you before hitting the lower surface in the case of a fall. This gives you the freedom to walk all the way up to a fall hazard to do your work.



As an example, let's say you are unloading a flatbed truck; your walking/working surface is so narrow that any system that wouldn't allow you near the edge would limit your movement. Where you need full access to your working surface, fall arrest is typically your better option. Ascending and descending a fixed ladder is another great example of when fall arrest systems are effective.

SPECIFIC OUTCOME – 4 / AC1

MEDICAL AND OTHER RISKS ASSOSIATED WITH FALLS

Falls from heights remain the biggest cause of occupational fatalities in the construction industry. According to a report by the Fatality Assessment and Control Evaluation program, 54% of workers killed had no access to a personal fall arrest system; and 20% of fatalities occurred in the victims' first two months on the job.

Injuries caused by falls are more likely to be life-threatening than most other types of injuries. While other common causes for accidents—such as falling objects, overexertion, or vehicle or machine accidents—are more likely to injure only a part of the body, injuries from falls can easily affect the whole body and vital organs.

The chances of surviving a fall from more than 9 m are low, but even 1.8 m can prove deadly when landing on the wrong body part or surface. Spinal, head, or neck injuries are a common result of falls, regardless of the height, and can leave the worker severely disabled or lead to death.

Although it seems to be the leading cause of death in the workplace, falls are actually not the most common cause of injury. Instead, overexertion and bodily reaction led to days away from work. Similarly, nonfatal injuries from contact with objects or equipment showed a similar incidence rate to falls, slips, or trips.

In other words, falls from height are not the most common type of accident, but when they happen, they are much more likely to be deadly than other occupational accidents. More so than the quantity of fall-related incidents, it is the severity that we need to focus on to decrease the number of fatalities.

Effective fall protection depends on an informed choice of equipment and knowledge on how to safeguard one and others from potential hazards. Workplace safety is, therefore, a two-step process, which involves, first, technical support from tools and machinery that can shield and protect in dangerous situations, and second, human support in the shape of comprehensive training, instructions and guidance.

Neglecting either of the two will most likely cause the safety system to have "holes" that will lead to breaches and dangerous working conditions for everyone at the site.

Safety equipment has become vastly effective and affordable in recent years, making it easy to choose the right solution to each individual task. Instead of going with one-size-fits-all solutions, well-tailored and modifiable equipment can potentially make every site completely hazard-free. A combination of fall arrest systems, edge protection, scaffolds and safety equipment (like lighting, ladders, protective gear, etc.) should be able to prevent injuries—if used correctly.

Even the newest and most expensive equipment won't keep a worker safe from accidents if the worker does not know how to use it. Therefore, safety training should be a top priority for any company, regardless of the size or the industry. Safety training at regular intervals, will educate staff on how to use tools, how to spot a potential hazard, and how to maintain a health and safety culture in the workplace that will spark awareness and interest in safety procedures among workers.

A good safety plan not only saves workers' lives, it also profits a company's revenue immensely. According to the National Safety Council, every R1000.00 invested in injury prevention can return between R2000.00 to R6000.00 as productivity increases, contentment with work and the workplace among employees rises, and higher retention creates a more sustainable and successful working environment.

The responsibility for creating urgency when it comes to safety culture lies with the employer. Fall protection stands or falls with every individual on site and cannot be considered solely as a structural or corporate issue.

Instead, the future of fall protection will be decided in close cooperation with those directly affected by it—the employees. Companies that take safety as a task that can be handled on the executive level are taking the wrong approach. An understanding of safety culture will only reach the worker if they are involved in the discussion, and only then can all work together to reduce fatalities.

The financial costs from fall-related injuries are substantial. Evidence suggests the implementation of effective prevention strategies with a subsequent 20% reduction in the incidence of falls could create substantial savings each year.

Across all age groups, both genders are at risk of falls. It has been noted that males are more likely to die from a fall, while females suffer more non-fatal falls. Males consistently sustain higher death rates and DALYs lost. Possible explanations of the greater burden seen among males may include higher levels of risk-taking behaviours and hazards within occupations.

Risk factors include:

- Occupations at elevated heights or other hazardous working conditions
- Alcohol or substance use
- Underlying medical conditions, such as neurological, cardiac or other disabling conditions
- Side effects of medication, physical inactivity and loss of balance
- Unsafe environments

Prevention:

- Enforcement of more stringent workplace safety regulations in high risk occupations such as the construction industry
- Fall-risk assessments to address identified risks
- Fence off, or otherwise restrict access to dangerous areas
- Functioning occupational health and safety systems
- Harnesses, restraint systems, fall arrest systems and safe scaffolding for those working at heights

Fall protection is required for anyone who is at risk of falling from more than 2 m. That's the height at which falls become noticeably more dangerous. However, Construction Research data shows, falls from a shorter elevation can still be fatal.

Chest injuries are more common in high falls, the commonest specific injuries being rib fractures, lung contusion, and the presence of air or gas in the membrane around the lung cavity, causing pain and difficulty in breathing. This can occur spontaneously because of accidental rupture or perforation of the membrane, in very high falls cardiac and aortic rupture are common

Decelerating rapidly - which is what happens if the human body falls and then makes sudden impact - can cause cells to rupture. Like cells, blood vessels can also break open, preventing the circulation of oxygen throughout the body. Without oxygen, our organs, including the brain, cease to function.

Falls can have a variety of outcomes ranging from no injury or minor injury, to serious injury or death.

Physical injuries can include:

- Pain

- Bruising
- Scratches and other superficial wounds
- Haematomas
- Lacerations
- Fractures
- Intracranial (into the skull) bleeding.

SPECIFIC OUTCOME – 4 / AC2

SUSPENSION TRAUMA

SUSPENSION TRAUMA (Aka Harness hang syndrome)

The most common cause is accidents in which the person remains motionless suspended in a harness for longer periods of time. Motionlessness may have several causes including fatigue, hypoglycaemia (the medical condition of having an unusually low level of sugar in the blood), hypothermia (unusually low body temperature) or traumatic brain injury.

Suspension Trauma (also called Orthostatic (upright position) Intolerance or Harness Hang Syndrome) is the loss of consciousness due to a victim being held upright with limited movement for a period of time, which can rapidly lead to death if not properly recognized and treated.

Too much blood gets trapped in your legs and you aren't able to adequately supply your brain with sufficient oxygen. Obviously, your heart is pumping blood into your legs, but gravity is also helping to 'pull' that blood towards the ground and keep it there. Clearly, the blood can't be allowed to just stay in the legs. So, to return it to the heart the body depends on 4 major methods:

1. The one-way valves in your veins. Veins are the blood vessels that bring blood back to the heart, and they're filled with valves that only let blood flow in one direction: towards the heart.
2. Your Skeletal-Muscle Pump. In this case, referring primarily to your leg muscles, every time your muscles contract, they get shorter and thicker and press against anything else around them (like your veins and the blood contained therein). The compression of the veins causes the blood to get pushed out of the way, and because of the one-way valves preventing backflow, this means towards the heart.
3. Your smooth muscles. Your veins also have small muscles surrounding them classified as smooth muscles (tunica media). These muscles control the diameter of the blood vessels and affect what's known as the "tone" of your vascular system. When these muscles contract, the diameter of the veins decreases, raising the blood pressure. Remember that the one-way valves keep blood flowing towards the heart, so if the same volume of blood

keeps entering a smaller pipe, the blood's velocity will have to increase, returning blood more quickly to the heart.

4. In Suspension Trauma, there are two key factors (and a possible third) which come into play, each of which severely impair blood from returning to your heart to supply oxygen to the brain:
   - a lack of movement,
   - body weight in the harness compressing veins, and possibly
   - A build-up of toxins in the blood (read below for more).

SPECIFIC OUTCOME – 4 / AC3

REPORTING INCIDENTS

The employer is stipulated by the COID to report any incident that result in disablement, death, unconsciousness to the Department of Labour. These types of accidents are termed as 'reportable injury' in terms of section 24 of the Occupational Health & Safety Act. An employer must meet compliance standards by using the correct form to report such incident called Annexure 1 form and address it to the Inspector or Occupational Health& Safety division at the Department of Labour. The above mentioned are the correct channels that an employer must follow according to a proper Incident Investigation Procedure so as to be considered to be compliant.

If the accident is fatal, an Inspector from the Department of Labour will be sent to conduct an inspection and his/her findings of the accident will be reported to the Chief Commissioner.

If the incident is minor or a near miss, the employer must refer the matter, for investigation, to the health and safety committee. The health and safety committee is expected to launch an internal investigation into the matter. They should establish the root cause and they should take action. They must implement control measures to prevent re-occurrence of the same incident.

The employer also has the duty to report an incident that needs compensation for to the Compensation Authority or the relevant authority as soon as possible. They expect to receive the required documents too.

All parties of the workplace have a duty to fulfil in the Incident Investigation Procedure, by correctly reporting incidents to their next superior in the authority hierarchy in the workplace. It is essential for all parties involved to know their roles and responsibility to ensure that an efficient incident reporting procedure is followed.

Incident reporting is a legal requirement and the correct compliant procedures and steps should be followed.

SPECIFIC OUTCOME – 4 / AC4

HEIGHT SAFETY SUPERVISOR

In 2015, the Institute for Work at Height Association and Professional Body, along with many other organisations operating in the construction, mining and occupational health and safety environment worked collaboratively to develop new 'Guidelines for Safe Working at Height'.

Construction supervisors oversee the construction of projects and monitor activities at worksites.

- They manage crews, ensure health and safety codes are observed, and that work is completed to schedule.
- Understand and apply legislative requirements
- Carry out hazard identification and risk control
- Understand permit requirements and the duties and responsibilities of all personnel involved
- Apply work positioning techniques
- Carry out rescue planning including self-rescue/contact rescue
- Rapid Response
- Working at Heights Permit Requirements
- Advanced Fall Arrest Techniques including:
- Anchor Selection
- Provision of Anchors (Drop Lines)
- Set Up and Use of Temporary (Static) Lifelines
- Limited Free Fall

Attributes of a construction supervisor:

- **An unwavering focus on safety**. Not only does this mentality protect the employer from liability, but it also conveys to the workers that their supervisor cares about their well-being.
- **The curiosity to experiment with new technologies**. Don't adhere to the "this is how it's always been done" mantra. Be open to working with digital compliance platforms, and other kinds of advanced technology.

- **A "big picture" mind set**: Make sure that all decisions made are consistent with regulatory, budgetary, and scheduling goals in mind.
- **Flexibility and adaptability:** Anything can happen on a construction site so you must be able to roll with the changes and keep on trucking.
- **The ability to establish goals and benchmarks**: Lay out a weekly or monthly schedule of deliverables and stick to it. It also helps the site work proceed more efficiently.
- **Solid writing skills**: Construction supervisors do a lot of writing – from memos and directives to workers to updates and reports for clients and regulators.
- **Excellent interpersonal skills**: You also must interact with a wide range of people.
- **The willingness to address problems immediately**: If machinery breaks down or someone gets injured, you must remedy the problem at once to minimize downtime – and then report it quickly to the proper authorities.
- **A talent for communicating with subordinates**. Good construction supervisors realize that their communication style should vary from person to person and from situation to situation.
- **The openness to delegating tasks when necessary:** Smart supervisors delegate tasks and authority to other employees to help keep the project on schedule.
- **A knack for embracing smart ideas**: Some of the best ideas come from the workers themselves. If someone makes a suggestion, give them the power and latitude to try it out to see if it works.
- **The integrity to follow the same rules and procedures as everyone else**: It's simple, the "do as I say, not as I do" attitude is the quickest way to alienate subordinates.
- **Not being averse to getting their hands dirty**: Every now and then, it's not a bad idea to pick up a hammer and pitch in to help. That's an easy way to earn the respect of those who work for you.

Succeeding as a construction supervisor involves a lot more than being competent, following schedules, and knowing building codes. You must make a commitment to do everything in your power to ensure that the project is completed in a timely manner, on budget, and safely. That's what separates the great construction supervisors from the rest of the pack.

SPECIFIC OUTCOME – 4 / AC5

EVALUATE WORKERS AND MEDICAL FITNESS

There are specific requirements relating to the management of the risk of falls for construction work. Many activities undertaken in workplaces can be considered construction work e.g. repairs and maintenance to structures such as roof gutters.

To comply with your duties under the Occupational Health and Safety Act (OHSA) and you will be trained on the safety rules to follow when working with ladders and scaffolding.

Working at Heights Training for performing work at heights

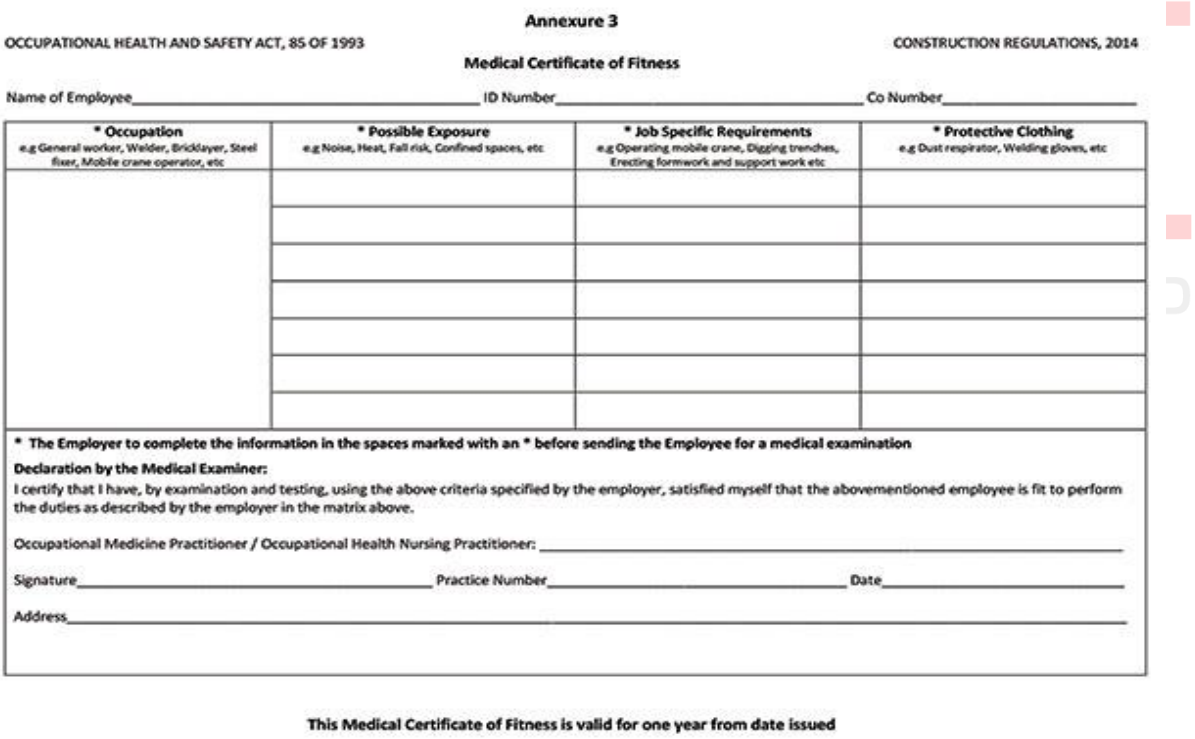
- Employees will have the skills and experience as well as knowledge necessary to set up and select working at heights equipment for safe use and operation
- The necessary skills to identify risks pertaining to working at heights in the workplace
- The necessary skills to eliminate the risk of severe injuries
- The necessary skills to eliminate the risk of fatal working at heights injuries
- Employees receiving working at heights training will be competent to do the task at hand in a safe manner.
- Individuals will be able to plan and organise working at heights work effectively.
- Individuals will be able to perform a risk assessment for any working at heights planned.
- Individuals will be able to select the appropriate work equipment to complete the task safely.
- Individuals will be able to properly inspect and maintain all working at heights equipment that is being used.
- Individuals will demonstrate to others that they are taking the necessary steps to meet the requirements in terms of the Occupational Health and Safety Act of 1993.

Construction regulations and the Medical Certificate of Fitness

The promulgation of the amended Construction Regulations in 2014 introduced the need to issue construction workers with medical certificates of fitness (MCoFs) based on the jobs in which they were employed. Regulation 7(8) of the Construction Regulations states: “A

contractor must ensure that all his or her employees have a valid medical certificate of fitness specific to the construction work to be performed and issued by an occupational health practitioner. The intention Annexure 3 is to ensure that a worker is certified as medically fit, based on the understanding of the tasks the he or she is required to perform relevant to the job requirements, the exposures he or she might encounter in the workplace, and the personal protective equipment required. If the intention of the legislator is embraced, then medical surveillance activities would be job-specific, moving away from the broad-brush approach where anything and everything is included in the medical examination. This is of benefit to both the worker (ensuring that the correct aspects of his or her health are monitored) and the employer (providing cost-effective medical examinations with the assurance that the correct testing is implemented to monitor workers' health).

Annexure 3 of the Occupational Health and Safety Act (Act No. 85 of 1993)



Annexure 3

OCCUPATIONAL HEALTH AND SAFETY ACT, 85 OF 1993 — CONSTRUCTION REGULATIONS, 2014

Medical Certificate of Fitness

Name of Employee_____ ID Number_____ Co Number_____

* Occupation e.g General worker, Welder, Bricklayer, Steel fixer, Mobile crane operator, etc	* Possible Exposure e.g Noise, Heat, Fall risk, Confined spaces, etc	* Job Specific Requirements e.g Operating mobile crane, Digging trenches, Erecting formwork and support work etc	* Protective Clothing e.g Dust respirator, Welding gloves, etc

* The Employer to complete the information in the spaces marked with an * before sending the Employee for a medical examination

Declaration by the Medical Examiner:

I certify that I have, by examination and testing, using the above criteria specified by the employer, satisfied myself that the abovementioned employee is fit to perform the duties as described by the employer in the matrix above.

Occupational Medicine Practitioner / Occupational Health Nursing Practitioner: _____

Signature_____ Practice Number_____ Date_____

Address_____

This Medical Certificate of Fitness is valid for one year from date issued

For a doctor or nurse to be recognised as an OHP, the following criteria must be met:

1. A doctor should be registered and in good standing with the Health Professions Council of South Africa (HPCSA), and have a tertiary qualification in occupational health/medicine

registered as an additional qualification with the HPCSA, or be registered as a specialist in Occupational Medicine with the HPCSA.

2. A nurse should be registered and in good standing with the South African Nursing Council (SANC), and have a tertiary qualification in Occupational Health Nursing approved by and registered with the SANC.

This updated guideline addressed the issue of who could conduct the medical assessment for the purpose of -completing Annexure 3.

3. The health and safety of employees and any affected persons must be promoted; and no prejudice may be practiced against employees and any affected persons.
4. Employers only accepted a MCoF in the format of the published Annexure 3, rejecting other amended formats submitted by occupational health practitioners (OHPs), which were developed to accommodate the need to record if an employee was deemed unfit or fit for work, but with restrictions.

SPECIFIC OUTCOME – 4 / AC6

SAFETY TRAINING RECORDS

Detailed recordkeeping is an essential aspect of any compliant training program. In addition to simplifying tracking, documenting your training can assist in determining when refresher or annual training is needed. Plus, training records are sure to be reviewed during an OSHA inspection to ensure your organization is in compliance, so it pays to be thorough.

Keeping records helps maintain an effective workplace health and safety management system. Records can help hazards and control risks before there is an incident which could cause injury or illness.

Training records have several uses during day-to-day operations. Use your records to:

- Help determine when annual refresher training is required.
- Keep track of an employee's qualifications for job assignment. If you see someone doing a job that requires specialized training, you can easily check to be certain he's received that training.
- Help you identify workers who have a solid training history and may be ready to handle more specialized training for jobs with more responsibility.

You should be prepared to periodically submit reports to management on:

- What training has taken place?
- Who's been trained?
- How much time was devoted to training?
- What training materials are available?
- How well training objectives have been met
- How training has improved safety
- What training is planned for the future

No matter what field your company operates in, training will be a key part of ensuring your operations run smoothly. When it comes to industries such as construction, mining, oil & gas, or transportation, this is particularly true. Good quality, in-depth training is essential for achieving a workforce of competent and skilled employees capable of carrying out their duties safely and effectively. But how do you keep track of the training needs of your firm? That often

depends on the size of your organization. The way a small family-owned company organizes its training records, for example, is likely to differ greatly from the methods employed by a multinational. However, some central principles remain the same, regardless of size, turnover, or the number of employees on your books.

It is imperative to know what training an employee has completed. Proper certificates need to be stored and easily accessible when required. Most training has an expiry date and keeping on top of both company and legal requirements is a necessity for avoiding accidents and maintaining a safe and efficient workforce. If you are a small firm, you may still be managing this process through the use of a spreadsheet. However, handling training records in this way has many limitations and runs the risk of missed requirements. A Training Record Management System (TRMS

These are some of the best ways to maintain your training records in the workplace:

1. Digitize Your Records

Storing paper records takes up a large amount of space and requires extensive time to file properly. Manually searching for specific records through multiple cabinets upon request can waste hours of valuable company time. Hours have often been lost to tracking down critical documentation that was misfiled or misplaced completely. Digitizing your records ensures files are not misplaced and are accessible on demand. Storing all records and documentation in a cloud-based system allows you to save money on space and time typically allotted to physical paper storage. Sophisticated search functions can locate and produce a document with a few keystrokes and employing the use of an online storage system means you can access this information from your PC, laptop, or mobile device.

2. Automate

One of the main downsides of using a spreadsheet for your company's training records is the time-intensive labour of ensuring the requirements are satisfied and up to date. Each employee has specific training needs. Overlooking a requirement or expiration can lead to severe consequences if an avoidable accident occurs. Automating the whole process removes this risk. A Training Matrix allows you to input all the roles in your organization and cross-reference them with the types of training and orientations required for that role. An automated system will assign required training to the relevant people, ensuring every employee in your small or large organization has its requirements to proceed safely. Expiration dates can be

tracked and supervisors and employees can be notified of upcoming expiries and auto-assign training to the individual.

3. Use Reporting Functions

Any great training record system will have robust reporting features built-in. It is essential to be able to produce visual reports quickly and easily to give an overview of training gaps. Gap analysis reports help to identify any training that is outstanding so it can easily be adjusted. From a broader perspective, it can highlight if there are issues with training not being completed in specific departments or sites. Having access to detailed, customized reports is invaluable and can identify training gaps and areas where you may be overspending on training. This allows you to redirect resources to where they are most needed.

4. Designate an Employee

It is important to designate a supervisor or administrator to oversee the training and management of records and documents for your company. The size and structure of your organization are likely to dictate who you choose for this role. In a small firm, coordinating training and records may be only one aspect of the employee's duties. In large companies employing thousands of people, there might be an entire team dedicated to this. However, having designated people for training and record-keeping ensures there is no confusion on responsibility.

5. Training Record Management System

A TRMS handles all training needs in one system. All the information you need relating to training will be in one place—accessible from anywhere. It automates the processes that are ordinarily very time-consuming such as identifying who needs what training, when they completed it, or when it is expired. Reporting functions enable you to produce detailed customized reports for insight into how your company's training. A designated person will still be necessary to oversee your company's training, however a TRMS allows everyone to share the responsibility by uploading certificates, receiving expiry notifications directly, and completing auto-assigned training promptly.

Maintaining training records in the workplace is essential for the effective operation of any company. Whether you are a small business or a multinational, you need to keep on top of training needs and ensure that all legal requirements are met. The maintenance of training records and certificates is critical to operating a safe and efficient work site.

Annexure A **EXAMPLE:**

PROJECT / JOB NAME:	
JOBSITE PHONE:	
PROJECT / JOB ADDRESS:	
JOB FOREMAN NAME:	
QUALIFIED PERSON:	

JOBSITE/BUILDING DETAILS

Use the following page to sketch and note the important details of the jobsite. Be sure to consider:

- Type of jobsite or building (e.g. two-story office block, commercial high-rise, towers)
- Type of work being done (e.g. maintenance, roofing, electrical,)
- Prevention through design measures already in place (e.g. permanent railings or permanent ladders)
- Relevant work surfaces & building materials (e.g. abrasive concrete edges, slippery floors)
- Estimated duration of job (should you consider longer-term solutions such as scaffolding vs. moveable lifts?)

Annexure B

	HAZARD	LOCATION	DIMENSIONS/DETAILS
OPEN-SIDED WALKING/WORKING SURFACES (I.E. ROOFS, OPEN-SIDED FLOORS)			
OPEN-SIDED RAMPS, RUNWAYS, PLATFORMS			
LEADING EDGE(S)			
FLOOR OPENINGS			
WALL OR WINDOW OPENINGS			
SKYLIGHT OPENINGS			
ELEVATOR SHAFT			
STAIRWELL			
TRENCHES			
UNEVEN SURFACES OR SURFACES THAT DO NOT MEET THE DEFINITION OF A WALKING/WORKING SURFACE			
OTHER:			

Annexure C

EXAMPLE

JOB HAZARDOUS ANALYSIS	
TASK NAME: **WORKING AT HEIGHT WITH CONTAINTER**	DATE: **23 MAY 2021**

TEAM: **JOHN TSABALALA, PETRUS MASIKO, GLEN MLATWA, BEN MOLETSI**

STEP	DESCRIPTION OF JOB STEP	HAZARD – POTENTIAL INCIDENT	WHO / WHAT WILL BE AFFECTED	RECOMMENDATION SAFE CONDITION/ACTIVITY
1	PREPARE CONTAINER FOR LIFTING	1. FALL WHILE LIFTING 2. USING INCORRECT LIFTING EQUIPMENT	LOAD / WORKERS CARRYING OUT THE TASK	1.1. LADDER TO BE USED FOR ACCESS TO THE TOP OF THE CONTAINERS AND MUST BE FOOTED. 1.2. INERTIA REEL TO BE ATTACHED TO CRANE HOOK BY 20KN SWL NYLON ROPE 1.3. RETRIEVING LINE ATTACHED TO INERTIA REEL HOOK MUST BE EFFECTIVE. 1.4. THE WORKERS WORKING AT HEIGHT SHALL WEAR SAFETY HARNESS WHICH SHALL BE ATTACHED BEFORE HE CLIMBS THE ACCESS LADDER AND REMOVED WHEN THE WORKER ASCENDS. 1.5. THE RETRIEVING LINE WILL LET THE REEL RETRACT AND RELEASE WHEN REQUIRED. 2.1. RIGGING EQUIPMENT MUST BE SELECTED BY A COMPETENT PERSON BASED ON THE SWL. 2.2. USE CERTIFIED AND CORRECTLY COLOUR CODED EQUIPMENT. 2.3 PRE-USE INSPECTION BY USER. 2.4 ONLY COMPETENT WORKERS TO CARRY OUT LIFTING TASK. 2.5 COMPETENT CRANE OPERATOR TO CARRY OUT LIFTING TASK. 2.6 USE PROPER PPE/ GLOVES/ SAFETY GOGGLES/ SAFETY BOOTS.

Annexure D

RISK MANAGEMENT

IDENTIFY & CLASSIFY	EVALUATE	MITIGATE & CONTROL	MONITOR & COMMUNICATE
Type: Internal – resources exposed External - involves third parties Category of Assets Exposed: Human Resources - employees - volunteers Real and tangible property, intellectual property Reputation (Public Image)	Severity of Impact: - Rate the consequences of an incident Frequency of Occurrence: - Rate the likelihood of an incident Chart the Risk: - Product of severity and frequency	Avoid or reduce activity (where possible) Transfer risk to others (through contract) Develop policies, safety training, early detection and emergency procedures and design changes Maximize financial Insurance. Utilize self underwriting where appropriate	Review and adjust Risk Management process Evaluate Incident Reports Provide feedback to CEO (16.2)

FEEDBACK
Continuous Process
Informs decisions at every stage
Ensure program effectiveness

Annexure E Example 2:

SAFE WORK PROCEDURE 021 - WORKING AT HEIGHTS	MAY 2021	DOC.12345/12/2021]

CRITICAL STEPS IN THIS ACTIVITY	POTENTIAL HAZARDS	RISK CONTROLS
IDENTIFICATION OF FALL HAZARDS WHEN WORKING FROM HEIGHTS. THESE TASKS INCLUDE:	RISKS OF THE TASK	UTILIZE THE REGULATIONS FOR WORKING AT HEIGHTS IN THE CONSTRUCTION REGULATIONS 2014
• UNDERTAKING SITE INSPECTION • CONDUCTING A RISK ASSESSMENT • ROOF REPAIRS • GUTTERS CLEANING • WORKING FROM ELEVATED PLATFORMS • SCAFFOLDS • BUILDING WORK	WORKERS ARE HANDLING UNSTABLE OR CUMBERSOME OBJECTS THAT CAN BE CAUGHT IN WIND THE TASK IS LENGTHY AN EXPOSES WORKERS FOR LONG PERIODS OF TIME WORKERS USE CHEMICALS SUCH AS SOLVENTS OR PAINTS MAY CAUSE DIZZINESS OR LOSS COORDINATION NEW OR INEXPERIENCED WORKERS ARE INVOLVED IN THE TASK	• PROVIDE SAFE ACCESS TO THE WORK AREA • PROVISION OF FORMAL RESCUE / EMERGENCY PLAN • PROVISION OF FORMAL TRAINING AND ASSESSMENT PROCESS • ASSESSMENT OF WEATHER CONDITIONS AND ITS IMPACT • ASSESSMENT OF GROUND LEVEL AND FLOOR CONDITIONS • ASSESSMENT OF APPROPRIATE RISK CONTROLS • LADDER SAFETY, DETERMINATION OF CORRECT LADDER FOR ACCESS • THE ACHIEVEMENT OF ACCEPTABLE LADDER RATION • SAFETY AND PERSONAL PROTECTIVE EQUIPMENT • TRAINING PROGRAM AND SUPERVISION • RECORD KEEPING

REV NO.	REASON FOR REVISION	PREPARED BY	REVIEWED BY	APPROVED BY	DATE
00	Initial release	Abc	Def	Ghi	
01	Standardization of Procedure	Abc	Def	Ghi	

Annexure F

Harness Inspection Guidelines

Webbing

Grasp the webbing with your hands and bend the webbing, checking both sides. This creates surface tension making damaged fibres or cuts easier to see. Webbing damage may not show up through a sight (visual) inspection only - manual (touch) the harness is equally important.

Visual and Touch Inspection	**√ Pass** **X Fail Criteria**
Cuts, nicks or tears	
Broken fibres/cracks	
Overall deterioration	
Modifications by user	
Fraying/Abrasions	
Discoloration of material Dependant on cause of discoloration	
Hard or shiny spots Indicates heat damage	
Webbing thickness uneven Indicates possible fall	
Mildew Clean harness	
Missing Straps	
Undue Stretching Indicates possible fall	
Burnt, charred or melted fibres Indicates heat damage	
Material marked w/permanent marker Check w/manufacturer	
Excessive hardness or brittleness Indicates heat or uv damage	
Stitching: Visual and Touch Inspection	
Pulled stitches	
Stitching that is missing	
Hard or shiny spots Indicates heat damage	
Cut stitches	
Discoloration of stitching Dependant on cause of discoloration	

Hardware : Visual and Touch Inspection	
Distortion (twists, bends)	
Rough or sharp edges	
Rust or corrosion	
Cracks or breaks	
Broken/distorted grommets	
Modification by users (i.e. additional holes)	
Tongue buckle should overlap the buckle frame and move freely back and forth in their socket	
Roller of tongue buckle should turn freely on frame	
Bars must be straight	
All springs must be in working condition	

Annexure G **Lanyard Inspection**

Shock Absorbing Lanyard Sling Inspection - Guidelines	**√ Pass** **X Fail Criteria**
Webbing Grasp the webbing with your hands and bend the webbing, checking both sides. This creates surface tension making damaged fibres or cuts easier to see. Webbing damage may not show up through a sight (visual) inspection only - manual (touch) the lanyard is equally important. Pay attention to the wrinkled portion of the lanyard.	

Visual and Touch Inspection

cuts, nicks or tears	
Broken fibres/cracks	
Overall deterioration	
Modifications by user	
Fraying/Abrasions	
Discoloration of material	
Hard or shiny spots	
Change in core size	
Mildew	
Missing or popped flag	
Undue Stretching	
Burnt, charred or melted fibres	
Material marked w/permanent marker	
Check w/manufacturer	
Excessive hardness or brittleness	
Indicates heat or UV damage	
Knots in lanyard	
Stitching	
Pulled stitches	
Stitching that is missing	
Hard or shiny spots	
Indicates heat damage	
Cut stitches	
Discoloration of stitching	
Dependant on cause of discoloration	

Annexure H

Draft
Illustration of a Fall Protection Plan

Fall Protection Program
Table of Contents

Illustration of a Fall Protection Plan for
Company Name

I. OBJECTIVE

The objective of the **Company Name** Fall Protection Program is to identify and evaluate fall hazards to which employees will be exposed and to provide specific training as required by the Occupational Safety and Health Administration (OSHA) Fall Protection Standard, 29**.**

II. POLICY

It is the policy of **Company Name** to protect its employees from occupational injuries by implementing and enforcing safe work practices and appointing a competent person(s) to manage the Fall Protection Program. The **Company Name** Fall Protection Program shall comply with the OSHA requirements. A copy of the OSHA Fall Protection Standard shall be made available to all employees, and may be obtained from

Responsible Person

III. ASSIGNMENT OF RESPONSIBILITY

A. Employer

It is the responsibility of **Company Name** to provide fall protection to affected employees, and to ensure that all employees understand and adhere to the procedures of this plan and follow the instructions of **Responsible Person** .

B. Program Manager

It is the responsibility of **Responsible Person** as the Fall Protection Program Manager to implement this program by

1. performing routine safety checks of work operations
2. enforcing **Company Name** safety policy and procedures
3. correcting any unsafe practices or conditions immediately;
4. training employees and supervisors in recognizing fall hazards and the use of fall protection systems;
5. maintaining records of employee training, equipment issue, and fall protection systems used at **Company Name** jobsites; and
6. investigating and documenting all incidents that result in employee injury.

C. Employees

It is the responsibility of all employees to:

1. understand and adhere to the procedures outlined in this Fall Protection Program
2. follow the instructions of **Responsible Person**
3. bring to management's attention any unsafe or hazardous conditions or practices that may cause injury to either themselves or any other employees; and
4. Report any incident that causes injury to an employee, regardless of the nature of the injury.

IV. TRAINING

A. All employees who may be exposed to fall hazards are required to receive training on how to recognize such hazards, and how to minimize their exposure to them. Employees shall receive training as soon after employment as possible, and before they are required to work in areas, where fall hazards exist.

B. A record of employees who have received training and training dates shall be maintained by **Responsible Person**. Training of employees by **Responsible Person** shall include:

1. Nature of the fall hazards employees may be exposed to.
2. Correct procedures for erecting, maintaining, disassembling, and inspecting fall protection systems.
3. Use and operation of controlled access zones, guardrails, personal fall arrest systems, safety nets, warning lines, and safety monitoring systems.
4. Role of each employee in the Safety Monitoring System (if used).
5. Limitations of the use of mechanical equipment during roofing work on low-slope roofs (if applicable).
6. Correct procedures for equipment and materials handling, and storage and erection of overhead protection.
7. Role of each employee in alternative Fall Protection Plans (if used).
8. Requirements of the OSHA Fall Protection Standard, 29 CFR 1926, Subpart M.
9. **Company Name** requirements for reporting incidents that causes injury to an employee.

C. Additional training shall be provided on an annual basis, or as needed when changes are made to this Fall Protection Program, an alternative Fall Protection Plan, or the OSHA Fall Protection Standard.

V. CONTROLLED ACCESS ZONES

A. Bricklayers are the only authorized employees permitted to enter controlled access zones and areas from which guardrails have been removed. All other workers are prohibited from entering controlled access zones.

B. Controlled access zones shall be defined by control lines consisting of ropes, wires, tapes, or equivalent material, with supporting upright supporting poles, and shall be:

1. Flagged with a high-visibility material at six 1.8 m intervals.
2. Rigged and supported so that the line is between 700 mm and 1.2 m from the walking/working surface.
3. Strong enough to sustain stress of at least 90 kg.
4. Extended along the entire length of an unprotected or leading edge.
5. Parallel to the unprotected or leading edge.
6. Connected on each side to a guardrail system or wall.
7. Erected between 1.8 m and 7.5 m from an unprotected edge, except in the following cases:
    a. when working with precast concrete members: between six 1.8 m and 18 m from the leading edge, or half the length of the member being erected, whichever is less; or
    b. when performing overhand bricking or related work: between 3 m and 4 m from the working edge.

VI. EXCAVATIONS

Fall protection will be provided to employees working at the edge of an excavation that is six 1.8 m or deeper.

Employees in these areas are required to use the fall protection systems as designated in this program.

A. Excavations that are 1.8 m or deeper shall be protected by guardrail systems, fences, barricades, or covers.
B. Walkways that allow employees to cross over an excavation that is 1.8 m or deeper shall be equipped with guardrails.

VII. FALL PROTECTION SYSTEMS

A. Covers

1. All covers shall be secured to prevent accidental displacement.

2. Covers shall be color-coded or bear the markings “HOLE” or “COVER”.
3. Covers located in roadways shall be able to support twice the axle load of the largest vehicle that might cross them.

4. Covers shall be able to support twice the weight of employees, equipment, and materials that might cross them.

B. Guardrail Systems

Guardrail systems shall be erected at unprotected edges, ramps, runways, or holes where it is determined by **Responsible Person** that erecting such systems will not cause an increased hazard to employees. The following specifications will be followed in the erection of guardrail systems. Top rails shall be:

1. at least 6 mm in diameter (steel or plastic banding is unacceptable);
2. flagged every 1.8 m or less with a high visibility material if wire rope is used;
3. inspected by **Responsible Person** as frequently as necessary to ensure strength and stability;

Midrails, screens, mesh, intermediate vertical members, and solid panels shall be erected in accordance with the OSHA Fall Protection Standard.

Gates or removable guardrail sections shall be placed across openings of hoisting areas or holes when they are not in use to prevent access.

C. Personal Fall Arrest Systems

1. Personal fall arrest systems shall be issued to and used by employees as determined by Responsible Person and may consist of anchorage, connectors, body harness, deceleration device, lifeline, or suitable combinations. Personal fall arrest systems shall:

a. limit the maximum arresting force to 1800 pounds (900 kg);
b. be rigged so an employee cannot free fall more than 1.8 m or contact any lower level;
c. bring an employee to a complete stop and limit the maximum deceleration distance traveled to three and a half 1.1 m;

d. be strong enough to withstand twice the potential impact energy of an employee free falling 1.8 m (or the free fall distance permitted by the system, whichever is less);

e. be inspected prior to each use for damage and deterioration; and

f. be removed from service if any damaged components are detected.

2. All components of a fall arrest system shall meet the specifications of the OSHA Fall Protection Standard, and shall be used in accordance with the manufacturer’s instructions.

a. The use of non-locking snaphooks is prohibited.
b. D-rings and locking snaphooks shall:

i. have a minimum tensile strength of 5000 pounds; and
ii. be proof-tested to a minimum tensile load of 3600 pounds without cracking, breaking, or suffering permanent deformation.

c. Lifelines shall be:

i. designed, installed, and used under the supervision of ***Responsible Person***;
ii. protected against cuts and abrasions; and

iii. equipped with horizontal lifeline connection devices capable of locking in both directions on the lifeline when used on suspended scaffolds or similar work platforms that have horizontal lifelines that may become vertical lifelines.

d. Self-retracting lifelines and lanyards must have ropes and straps (webbing) made of synthetic fibers, and shall:

i. sustain a minimum tensile load of 1.6 ton if they automatically limit free fall distance to two 600 mm; or
ii. sustain a minimum tensile load of 2.3 ton (includes rip stitch, tearing, and deforming lanyards).

e. Anchorages must support at least 2.3 ton per person attached and shall be:

i. designed, installed, and used under the supervision of ***Responsible Person***;
ii. capable of supporting twice the weight expected to be imposed on it; and
iii. independent of any anchorage used to support or suspend platforms.

D. Positioning Device Systems

Body belt or body harness systems shall be set up so that an employee can free fall no farther than two (2) feet, and shall be secured to an anchorage capable of supporting twice the potential impact load or 1.4 ton, whichever is greater. Requirements for snaphooks, dee-rings, and other connectors are the same as detailed in this Program under *Personal Fall Arrest Systems.*

E. Safety Monitoring Systems

In situations when no other fall protection has been implemented, ***Responsible Person(s)*** shall monitor the safety of employees in these work areas. The ***Responsible Person(s)*** shall be:

1. competent in the recognition of fall hazards;
2. capable of warning workers of fall hazard dangers;
3. operating on the same walking/working surfaces as the employees and able to see them;
4. close enough to work operations to communicate orally with employees; and
5. free of other job duties that might distract them from the monitoring function.

No employees other than those engaged in the work being performed under the Safety Monitoring System shall be allowed in the area. All employees under a Safety Monitoring System are required to promptly comply with the fall hazard warnings of the ***Responsible Person(s)***.

F. Safety Net Systems

1. Safety net systems must be installed no more than 30 feet below the walking/working surface with sufficient clearance to prevent contact with the surface below, and shall be installed with sufficient vertical and horizontal distances as described in the OSHA Fall Protection Standard.

2. All nets shall be inspected at least once a week for wear, damage, or deterioration by **Responsible Person**. Defective nets shall be removed from use and replaced with acceptable nets.

3. All nets shall be in compliance with mesh, mesh crossing, border rope, and connection specifications as described in the OSHA Fall Protection Standard.

4. When nets are used on bridges, the potential fall area from the walking/working surface shall remain unobstructed.

5. Objects that have fallen into safety nets shall be removed as soon as possible, and at least before the next working shift.

G. Warning Line Systems

Warning line systems consisting of supporting stanchions and ropes, wires, or chains shall be erected around all sides of roof work areas.

1. Lines shall be flagged at no more than six (6) foot intervals with high-visibility materials.

2. The lowest point of the line (including sag) shall be between 34 and 39 inches from the walking/working surface.

3. Stanchions of warning line systems shall be capable of resisting at least 16 pounds of force.

4. Ropes, wires, or chains must have a minimum tensile strength of 500 pounds.

5. Warning line systems shall be erected at least six (6) feet from the edge, except in areas where mechanical equipment is in use. When mechanical equipment is in use, warning line systems shall be erected at least six (6) feet from the parallel edge, and at least ten (10) feet from the perpendicular edge.

VIII. TASKS AND WORK AREAS REQUIRING FALL PROTECTION

Unless otherwise specified, ***Responsible Person(s)*** shall evaluate the worksite(s) and determine the specific type(s) of fall protection to be used in the following situations.

A. Framework and Reinforcing Steel
Fall protection will be provided when an employee is climbing or moving at a height of over 24 feet when working with rebar assemblies.

B. Hoist Areas
Guardrail systems or personal fall arrest systems will be used in hoist areas when an employee may fall six (6) feet or more. If guardrail systems must be removed for hoisting, employees are required to use personal fall arrest systems.

C. Holes
Covers or guardrail systems shall be erected around holes (including skylights) that are six (6) feet or more above lower levels. If covers or guardrail systems must be removed, employees are required to use personal fall arrest systems.

D. Leading Edges
Guardrail systems, safety net systems, or personal fall arrest systems shall be used when employees are constructing a leading edge that is six (6) feet or more above lower levels. An alternative Fall Protection Plan shall be used if ***Responsible Person(s)*** determines that the implementation of conventional fall protection systems is infeasible or creates a greater hazard to employees. All alternative Fall Protection Plans for work on leading edges shall:

1. be written specific to the particular jobsite needs;

2. include explanation of how conventional fall protection is infeasible or creates a greater hazard to employees;

3. explain what alternative fall protection will be used for each task;

4. be maintained in writing at the jobsite by ***Responsible Person***; and

5. meet the requirements of 29 CFR 1926.502(k).

E. Overhand Bricklaying and Related Work

Guardrail systems, safety net systems, personal fall arrest systems, or controlled access zones shall be provided to employees engaged in overhead bricklaying or related work six (6) feet or more above the

lower level. All employees reaching more than ten (10) inches below the walking/working surface shall be protected by guardrail systems, safety net systems, or personal fall arrest systems.

F. Precast Concrete Erection

Guardrail systems, safety net systems, or personal fall arrest systems shall be provided to employees working six (6) feet or more above the lower level while erecting or grouting precast concrete members. An alternative Fall Protection Plan shall be used if ***Responsible Person(s)*** determines that the implementation of conventional fall protection systems is infeasible or creates a greater hazard to employees. All alternative Fall Protection Plans for precast concrete erection shall:

1. be written specific to the particular jobsite needs;

2. include explanation of how conventional fall protection is infeasible or creates a greater hazard to employees;

3. explain what alternative fall protection will be used for each task;

4. be maintained in writing at the jobsite by ***Responsible Person***; and

5. meet the requirements of 29 CFR 1926.502(k).

IX. PROTECTION FROM FALLING OBJECTS

When guardrail systems are in use, the openings shall be small enough to prevent potential passage of falling objects. The following procedures must be followed by all employees to prevent hazards associated with falling objects.

A. No materials (except masonry and mortar) shall be stored within four (4) feet of working edges.
B. Remove excess debris to keep work areas clear.
C. During roofing work, materials and equipment shall be stored no less than 1.8 m from the roof edge unless guardrails are erected at the edge.
D. Stacked materials must be stable and self-supporting.
E. Canopies shall be strong enough to prevent penetration by falling objects.
F. Toe boards erected along the edges of overhead walking/working surfaces shall be:

    1. capable of withstanding a force of at least 22 kg; and

    2. solid with a minimum of 75 mm tall and no more than 25mm clearance above the walking/working surface.

G. Do not pile equipment higher than the toe board unless sufficient paneling or screening has been erected above the toe board.

X. ACCIDENT INVESTIGATIONS

All incidents that result in injury to workers, as well as near misses, regardless of their nature, shall be reported and investigated. Investigations shall be conducted by **Responsible Person** as soon after an incident as possible to identify the cause and means of prevention to eliminate the risk of reoccurrence.

In the event of such an incident, the Fall Protection Program (and alternative Fall Protection Plans, if in place) shall be reevaluated by **Responsible Person** to determine if additional practices, procedures, or training are necessary to prevent similar future incidents.

XI. CHANGES TO THE PLAN

Any changes to the Fall Protection Program (and alternative Fall Protection Plans, if in place) shall be approved by **Responsible Person**, and shall be reviewed by a qualified person as the job progresses to determine additional practices, procedures or training needs necessary to prevent fall injuries. Affected employees shall be

notified of all procedure changes, and trained if necessary. A copy of this plan, and any additional alternative Fall Protection Plans, shall be maintained at the jobsite by **Responsible Person** .

XII. GLOSSARY

Anchorage: a secure point of attachment for lifelines, lanyards, or deceleration devices.

Body belt: a strap with means both for securing it about the waist and for attaching it to a lanyard, lifeline, or deceleration device.

Body harness: straps that may be secured about the person in a manner that distributes the fall-arrest forces over at least the thighs, pelvis, waist, chest, and shoulders with a means for attaching the harness to other components of a personal fall arrest system.

Connector: A device that is used to couple (connect) parts of a personal fall arrest system or positioning device system together.

Controlled access zone: a work area designated and clearly marked in which certain types of work (such as overhand bricklaying) may take place without the use of conventional fall protection systems (guardrail, personal arrest, or safety net) to protect the employees working in the zone.

eceleration device: any mechanism, such as a rope, grab, ripstitch lanyard, specially-woven lanyard, tearing lanyard, deforming lanyard, or automatic self-retracting lifeline/lanyard, which serves to dissipate a substantial amount of energy during a fall arrest, or otherwise limits the energy imposed on an employee during fall arrest.

Deceleration distance: the additional vertical distance a falling person travels, excluding lifeline elongation and free fall distance, before stopping, from the point at which a deceleration device begins to operate.

Guardrail system: a barrier erected to prevent employees from falling to lower levels.

Hole: a void or gap two (2) inches (5.1 centimeters) or more in the least dimension in a floor, roof, or other walking/working surface.

Lanyard: a flexible line of rope, wire rope, or strap that generally has a connector at each end for connecting the body belt or body harness to a deceleration device, lifeline, or anchorage**.**

Leading edge: the edge of a floor, roof, or formwork for a floor or other walking/working surface (such as a deck) which changes location as additional floor, roof, decking, or formwork sections are placed, formed, or constructed.

Lifeline: a component consisting of a flexible line for connection to an anchorage at one end to hang vertically (vertical lifeline), or for connection to anchorages at both ends to stretch horizontally (horizontal lifeline), that serves as a means for connecting other components of a personal fall arrest system to an anchorage.

Low slope roof: a roof having a slope less than or equal to 4 in 12 (vertical to horizontal).

Opening: a gap or void 30 inches (76 centimeters) or more high and 18 inches (46 centimeters) or more wide, in a wall or partition through which employees can fall to a lower level.

Personal fall arrest system: a system including but not limited to an anchorage, connectors, and a body harness used to arrest an employee in a fall from a working level.

Positioning device system: a body belt or body harness system rigged to allow an employee to be supported on an elevated vertical surface, such as a wall, and work with both hands free while leaning backwards.

Rope grab: a deceleration device that travels on a lifeline and automatically, by friction, engages the lifeline and locks to arrest a fall.

Safety monitoring system: a safety system in which a competent person is responsible for recognizing and warning employees of fall hazards.

Self-retracting lifeline/lanyard: a deceleration device containing a drum-wound line which can be slowly extracted from, or retracted onto, the drum under minimal tension during normal employee movement and which, after onset of a fall, automatically locks the drum and arrests the fall.

Snaphook: a connector consisting of a hook-shaped member with a normally closed keeper, or a similar arrangement, which may be opened to permit the hook to receive an object and, when released automatically, closes to retain the object.

Steep roof: a roof having a slope greater than 4 in 12 (vertical to horizontal).

Toeboard: a low protective barrier that prevents material and equipment from falling to lower levels and which protects personnel from falling.

Unprotected sides and edges: any side or edge (except at entrances to points of access) of a walking/working surface (e.g., floor, roof, ramp, or runway) where there is no wall or guardrail system at least 39 inches (1 meter) high.

Walking/working surface: any surface, whether horizontal or vertical, on which an employee walks or works, including but not limited to floors, roofs, ramps, bridges, runways, formwork, and concrete reinforcing steel. Does not include ladders, vehicles, or trailers on which employees must be located to perform their work duties.

Warning line system: a barrier erected on a roof to warn employees that they are approaching an unprotected roof side or edge and which designates an area in which roofing work may take place without the use of guardrail, body belt, or safety net systems to protect employees in the area.

Rev no.	Reason for Revision	Prepared by	Reviewed by	Approved by	Date
00	Initial release	Abc	Def	Ghi	
01	Standardization of Procedure	Abc	Def	Ghi	

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

REGISTERED UNIT STANDARD:

Assess a worksite for work at height and prepare a fall protection plan

SAQA US ID	UNIT STANDARD TITLE			
229994	Assess a worksite for work at height and prepare a fall protection plan			
ORIGINATOR				
SGB Hiring Services				
PRIMARY OR DELEGATED QUALITY ASSURANCE FUNCTIONARY				
-				
FIELD			SUBFIELD	
Field 11 - Services			Cleaning, Domestic, Hiring, Property and Rescue Services	
ABET BAND	UNIT STANDARD TYPE	PRE-2009 NQF LEVEL	NQF LEVEL	CREDITS
Undefined	Regular	Level 4	NQF Level 04	3
REGISTRATION STATUS		REGISTRATION START DATE	REGISTRATION END DATE	SAQA DECISION NUMBER
Reregistered		2018-07-01	2023-06-30	SAQA 06120/18
LAST DATE FOR ENROLMENT		LAST DATE FOR ACHIEVEMENT		
2024-06-30		2027-06-30		

In all of the tables in this document, both the pre-2009 NQF Level and the NQF Level is shown. In the text (purpose statements, qualification rules, etc), any references to NQF Levels are to the pre-2009 levels unless specifically stated otherwise.

This unit standard does not replace any other unit standard and is not replaced by any other unit standard.

PURPOSE OF THE UNIT STANDARD

Learners wishing to acquire the competencies in this standard will be people responsible for the safety and protection of people working at height where there is a risk of injury from a fall. The learner will be responsible for the safety of others performing tasks at height. Qualifying learners are able to develop fall protection plans for people working at height, required by the Occupational Health and safety act (Act 85 of 1993).

The qualifying learner is capable of:
- Performing a risk assessment of the worksite where work is to be done at height.
- Demonstrating knowledge of fall arrest rescue equipment and advanced fall arrest rescue.
- Developing a fall protection plan and fall arrest plan.
- Managing safety of personnel working at heights.

In order for a successful learner of this standard to be able to function in a rope access operation, the learner must:
- Be medically fit and in possession of a medical certificate, declaring him/her free from a condition that may prevent him/her from working safely as specified in the range statement. (An example of the content of the medical certificate is available in SABS 0333:2 Annex A.)
- Have knowledge of suspension trauma.

LEARNING ASSUMED TO BE IN PLACE AND RECOGNITION OF PRIOR LEARNING

Learners accessing this unit standard will have demonstrated competence in:

- Communication at NQF Level 3 or equivalent.
- Mathematical Literacy at NQF Level 3 or equivalent.

UNIT STANDARD RANGE

- The scope of this unit standard is for any person who needs to draw up fall protection plans for persons performing work at height.
- In the context of this unit standards fall protection refers to the prevention of falls and fall arrest to the equipment used to stop a person from a fall from a height or elevated position.
- It applies to situations where work is performed at a height where there is risk of injury from a fall. In legislation the height is considered to be 3m above ground level.
- This unit standard is suitable for personnel who are responsible for preparing fall protection plans for people working at height for example a safety officer or supervisor.
- Assessment criteria marked * indicate assessment according to worksite procedures.
- Compatibility of equipment of include but is not limited to size of anchor, sharp items, prevent damage, point loading, size of hook.
- Connectors include but are not limited to maillons, locking carabiner, double action snap hook, pylon hook, double action scaffold hook.
- Energy absorber includes fall arrest harness and work positioning system.
- Fall arrest equipment include personal equipment, full body harness, deceleration devices, lifelines, helmet, work positioning system, lanyard and energy absorber, shock absorbing lanyard, retractable life-line. It excludes body belts.
- Fall arrest equipment includes all hardware, software, harnesses, lanyard and slings for fall protection and fall arrest.
- Fall arrest plan includes the fall arrest equipment, rescue equipment, requirements of the Occupational Health and Safety Act, rescue procedures, medical back up within 15 minutes.
- Fall arrest system includes energy absorbing lanyard including 2 singles, v-type, double legged lanyard or double lanyard.
- Fall prevention equipment include personal equipment, body harness, body belt, lanyard, life-lines, physical equipment, including but not limited to guardrails, screens, barricades, anchorages.
- Fall protection plan includes risk assessment, evaluation of personnel's' physical and psychological fitness ((medical physical and psychological), training for people working at height, procedures for equipment inspection, testing and maintenance fall protection equipment, requirements of the Occupational health and safety act).
- Hardware includes connectors, maillons, locking carabiner, double action hooks. Inspection criteria for hardware include checking hardware for damage, deformation and functioning.
- Hazards include but are not limited to potential falls of persons, material, equipment, strong winds, fumes, electricity and so forth.
- Legislation governing the safety of work at height includes detailed knowledge of the requirements for fall arrest as describe in the Occupational Health as safety act and the relevant regulations.
- Medically fit means learners should be free from any disability that may prevent them from working safely. These include but are not limited to heart disease, high blood pressure, epilepsy, fits and blackouts, fear of heights, giddiness or difficulty with balance, impaired limb function, alcohol or drug dependence, psychiatric illness, diabetes. Physical and psychological fitness necessary to work at elevated positions.
- PPE include but is not limited to helmets with a chinstrap, gloves, goggles, safety footwear, close fitting overalls or items specified for the task. Inspection criteria for helmets include damage, intact chinstrap.
- Risks while awaiting rescues can include suspension trauma, position, physical injury, injury from hot surfaces, electricity, fumes, water. Feet to be kept moving to prevent reduced flow of blood to the brain that can lead to unconsciousness or death.
- Slings include but are not limited to certified tape slings, wire slings and rope slings.
- Software include harness, work positioning harness, and energy-absorbing lanyard. Inspection criteria for software include checking stitching, webbing, identification or labels, buckles, D-rings and connectors.

Specific Outcomes and Assessment Criteria:

SPECIFIC OUTCOME 1

Perform a risk assessment of the worksite where work is to be done at height.

OUTCOME RANGE

Risk assessment includes all of the following: identification of risks and hazards, evaluation of risks, documented work procedures, monitoring of the plan, review of plan.

ASSESSMENT CRITERIA

ASSESSMENT CRITERION 1

A worksite, where work is to be done at height, is assessed for risks.

ASSESSMENT CRITERION RANGE

Assessment including hazard identification, hazard analysis and risk evaluations.

ASSESSMENT CRITERION 2

Hazard analysis is done to consider the likelihood and severity of hazards to determine their significance.

ASSESSMENT CRITERION 3

The requirements of the person performing risk assessments are listed based on legal requirements.

ASSESSMENT CRITERION 4

Safe work procedures, monitoring and review plans are developed for at least three hazards to reduce or control the identified risks.

ASSESSMENT CRITERION 5

Ways to protect and prevent falls of people, equipment and materials are described using three examples.

ASSESSMENT CRITERION 6

The content of a comprehensive risk assessment is listed based on legal requirements and the reasons for making documented risk assessments available to the worksite are explained with examples of the consequences of not doing so.

ASSESSMENT CRITERION 7

Personnel who are required to receive safety training in hazards and work procedures in terms of work site assessment are identified with examples and reasons given for their choice.

SPECIFIC OUTCOME 2

Demonstrate knowledge of fall arrest rescue equipment and advanced fall arrest rescue techniques.

ASSESSMENT CRITERIA

ASSESSMENT CRITERION 1

The different requirements and use of a comprehensive range of fall arrest and fall prevention equipment are described with examples.

ASSESSMENT CRITERION RANGE

Include retractable lanyards, energy absorbing lanyards, guided type fall arresters on anchor lines.

ASSESSMENT CRITERION 2

The rescue equipment needed for various rescue situations are listed with examples of their application.

ASSESSMENT CRITERION RANGE

Includes rescue equipment for simple lowering techniques, for hauling systems, and for fall arrest rescues using cableways.

ASSESSMENT CRITERION 3

The use of each of the various rescue techniques are explained with examples of when simple lowering techniques, hauling systems and cable ways are used.

ASSESSMENT CRITERION 4

The terms, "shock load", "fall factors" and "anchor loads", are explained with examples and safe loading of an anchor point which is calculated according to manufacturer's instructions.

ASSESSMENT CRITERION 5

The reason for ensuring that appropriate rescue equipment is available is explained with examples of the consequences.

ASSESSMENT CRITERION 6

A procedure for fall arrest equipment inspection, maintenance and testing is drawn up, implemented and maintained to demonstrate that equipment meets statutory requirements.

ASSESSMENT CRITERION RANGE

Includes all hardware, software, harnesses, lanyard and slings for fall protection and fall arrest.

SPECIFIC OUTCOME 3

Develop a fall protection plan and fall arrest plan.

ASSESSMENT CRITERIA

ASSESSMENT CRITERION 1

A fall protection plan is prepared for a real or simulated environment, based on the requirements of the Occupational Health and Safety Act, Building Regulations.

ASSESSMENT CRITERION 2

The maintenance and distribution of a fall protection plan is discussed with examples.

ASSESSMENT CRITERION 3

A fall protection plan is prepared based on the requirements of the Occupational Health and Safety Act, Construction Regulations.

ASSESSMENT CRITERION 4

The difference between fall protection and fall arrest is described with examples of each.

SPECIFIC OUTCOME 4

Manage safety of personnel working at heights.

ASSESSMENT CRITERIA

ASSESSMENT CRITERION 1

Medical and other risks associated with falls are explained with examples.

ASSESSMENT CRITERION 2

The cause for suspension trauma that can lead to death is explained and precautions described with examples.

ASSESSMENT CRITERION 3

The requirements for reporting a height safety incident are explained in accordance with current legislation.

ASSESSMENT CRITERION 4

The reasons why it is best to let people work in teams under a supervisor during working at height are explained with examples.

ASSESSMENT CRITERION 5

The factors to consider when evaluating people's suitability for performing work at height are listed according to statutory requirements including health and training.

ASSESSMENT CRITERION 6

Safety training records for personnel working at height are maintained and the requirements described according to current legislation.

UNIT STANDARD ACCREDITATION AND MODERATION OPTIONS

- Any institution or provider offering learning that will enable achievement of this unit standard must be accredited by the relevant ETQA.
- To assess competency, an assessor must be registered by the relevant ETQA as an assessor.
- Internal and external Moderation of the assessment will be overseen by the relevant ETQA according to the moderation guidelines outlined in the relevant qualification and agreed ETQA procedures.
- Assessors will need to be assessed as competent against the unit standards:

> Perform a range of advanced fall arrest rescue.
> Assess a worksite for work at height and prepare a fall protection plan.

UNIT STANDARD ESSENTIAL EMBEDDED KNOWLEDGE

- Fall arrest equipment and limitations.
- Fall factors and shock loading.
- Content of fall protection plans and legislation governing work at height.
- Knowledge of the mechanism for suspension trauma.

UNIT STANDARD DEVELOPMENTAL OUTCOME

N/A

UNIT STANDARD LINKAGES

N/A

Critical Cross-field Outcomes (CCFO):

UNIT STANDARD CCFO IDENTIFYING

Identify and solve problems in which response displays that responsible decisions, using critical and creative thinking, have been made.

UNIT STANDARD CCFO WORKING

Work effectively with others as a member of a team, group, organisation or community.

UNIT STANDARD CCFO ORGANISING

Organise and manage oneself and one's activities responsibly and effectively.

UNIT STANDARD CCFO COMMUNICATING

Communicate effectively by using mathematical and/or language skills in the modes of oral and/or written presentation.

UNIT STANDARD CCFO SCIENCE

Use science and technology effectively and critically, showing responsibility towards the environment and health of others.

UNIT STANDARD CCFO CONTRIBUTING

Contribute to the full personal development of each learner and the social and economic development of the society at large by:

- Participating as a responsible citizen in the life of local, national and global communities.
- Being culturally and aesthetically sensitive across a range of social contexts.

UNIT STANDARD ASSESSOR CRITERIA

N/A

REREGISTRATION HISTORY

As per the SAQA Board decision/s at that time, this unit standard was Reregistered in 2012; 2015.

UNIT STANDARD NOTES

Supplementary information:

Definition of terms:

- Engineered anchor point refers to anchor points that have been specifically designed taking into account the material and the loads. Some international standards require these to withstand forces of/equivalent to 6x2= 12kN. Example - sufficiently strong enough to lift a "Uno".
- Fall arrest equipment refers to equipment used to stop (arrest) the person in a fall from an elevated position.
- Fall prevention equipment refers to equipment used to prevent persons from falling from an elevated position.
- Hazard identification refers to identification and documentation of existing or expected hazards (things that can cause harm) to the health and safety of persons which are normally associated with the type of work being performed.
- Non-Engineered anchor points refer to an anchor point that has not specifically been designed as an anchor point. It could include railings or structures. Some international standards require these to have an additional safety factor and to withstand a force of/equivalent to 22kN. Sufficiently strong enough to lift a "four by four" vehicle.

- Locking karabiner refers to a type of metal shackle or clip formed by a complete loop with a spring loaded entry gate which is safeguarded in the closed position by a screw-closed sleeve.
- Lanyard refers to a rope made of synthetic fibre, wire, webbing or chain in accordance to SANS 354.
- Legislation governing the safety of work at height refers to the Occupational Health and safety act (Act 85 of 1993 and its amendments).
- PPE or personal protective equipment refers to any device or appliance designed to be worn or held by an individual for protection against potential hazard. Helmet SABS EN 397./SANS 50397.
- Suitable helmets need to conform to the requirements in SABS/EN 397.