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FALL PROTECTION PLAN

Document Number:	Revision Number:	Effective Date:
NE – SOP – 04 - 15	03	03.03.2016

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1. Definitions

Anchor Point:

An attachment point at an anchor for anchor lines or persons (SANS50795 or EN 795).

Competent Person:

Competent person for any task is a person who has acquired, through training, experience, qualifications and/or experience, or a combination of them, the knowledge and skills to carry out that task, provided that where appropriate qualifications and training are registered in terms of the provisions of the South African Qualifications Authority Act, 1995 (Act No. 58 of 1995), these qualifications and training shall be deemed to be the required qualifications and training.

Energy Absorbing Lanyard:

The connecting element or component of a fall arrest system. A lanyard may be of synthetic fibre rope or webbing. It must have an energy absorbing component incorporated into it, which will keep the impact force below 6 kN shock force in the event of a fall.

Fall Prevention Equipment:

Equipment used to prevent persons from falling from a fall risk position, including personal equipment, body harness, lanyards, lifelines or physical equipment such as guardrails, screens, barricades, anchorages or similar equipment.

Fall Arrest Equipment:

Equipment used to arrest the person in a fall, including personal equipment such as body harness, lanyards, deceleration devices, lifelines or similar equipment, but excludes single belts.

Fall Arrest System:

An assembly of components joined together so that, when connected to a suitable anchor point with sufficient clearance from the ground or other obstacles, it operates as a complete arrangement of equipment able to fulfil its function in use of arresting a fall.

Fall Protection Plan:

A documented plan of all risks relating to working from a fall risk position, considering the nature of work undertaken, and setting out the procedures and methods to be applied in order to eliminate the risk and must include a rescue plan and procedures.

Fall Risk:

Refers to any potential exposure to the risk of falling. (Items falling on workers, workers falling from an elevated position or workers dropping items onto other workers). Work cannot continue on site unless this fall risk(s) has been mitigated, reduced and controlled to acceptable levels.

Fixed Barricade:

Barricading provided to prevent persons from entering areas where there is a fall risk, falling objects, slipping, open trenches or manholes.

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Full Body Harness:

Body support primarily for fall arrest purposes, i.e. a component of a fall arrest system. Full body harness may comprise of straps, fittings, buckles or other elements, suitably arranged and assembled to support the whole body of a person and to restrain the wearer during a fall and after the arrest of a fall.(SANS50361)

Hazard Identification:

The identification and documenting of existing or expected hazards to the health and safety of persons, which are normally associated with the type of construction work being executed or to be executed

Low Level Work Restraint:

Using specific work at height equipment and procedures to prevent a fall or keep the fall distance to a minimum in low level work areas from 2 to 6m above ground level or work platform level.

Medical Fitness:

Refers to being declared medically healthy and fit to work safely in a fall risk position or such similar environment and being in possession medical certificate of fitness.

Medical Certificate of Fitness:

A certificate issued by a medical health practitioner registered with the Health Professions Council of South Africa. Such a certificate will become invalid, temporarily or permanently, subject to a consultation with a health practitioner, if medical or mental conditions occurred or emerged during the period.

Method Statement:

A written document detailing the key activities to be performed in order to reduce, as reasonably as practicable, the hazards identified in any risk assessment.

Minimum Free Space (MFS):

Fall arrest system is designed to limit the force on the body during a fall. This is achieved by absorbing the energy generated in the fall, by applying an arresting force to the faller over a distance i.e. the “arrest distance”. In order to prevent the possibility of a collision, there must be sufficient free space under the user for the fall to be arrested in, i.e. the free space must be greater than the arrest distance. Free space means that the path of fall is free from obstacles.

Non-Building Structure:

Refers to bridges, viaducts, overpasses, towers, tanks, bill boards, antennas, and other similar structures.

Permanent Barricade:

Barricading which is permanently fixed to prevent falling, or to provide support when ascending or descending stairways using three points of contact system, such as hand-railing etc.

Mini Hazard Identification Risk assessment (Mini HIRA):

Is a risk assessment that is completed by the site supervisor at the work site before work can commence.

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Power Tools:

All Portable electrical equipment including but not limited to welders and cutting torches, angle grinders and drills etc.

Risk Assessment:

A process of determining all risks associated with all hazards at a specific construction site, in order to identify the steps needed to be taken to eliminate, mitigate, and or control such hazards.

Rope Access:

A technique using ropes, normally incorporating two separately secured systems, one as a means of access and the other as back-up security, used with a harness in combination with other devices, for getting to and from the place of work and for work positioning.

Suspended Platform:

A working platform suspended from supports by means of one or more separate ropes from each support.

Steel Erection:

Refers to any steel construction, part of a steel member or building or non-building structure that needs to be erected.

Toolbox Talks:

Communicating the daily hazards and risks on site to the workers and it provides an opportunity to reinforce the safe working procedures and PPE for that specific daily task; it is the most practical step in connecting paperwork and actual work force.

Working Platform:

A platform whose purpose is to support the combined imposed loads of workers, materials and plant.

Work:

Any task, observation or inspection performed by an Namaqua Engineering employed person.

Drop Zone

Open Area wear working at elevated positions are in progress and the risk of equipment or material falling is possible.

Work at Height:

Any work performed above or below a stable work surface, or where a person puts himself in a position where he exposes himself to a fall to a lower level or into an area that will result in an injury.

Work Positioning:

A technique that enables a person to work supported in tension or suspension by personal protective equipment in such a way that a fall from a height is prevented or restricted.

Work restraint:

A technique whereby a person is prevented by means of a harness and other devices from reaching zones where the risk of a fall from a height exists.

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Work at Height Awareness Training:

The following working at heights awareness training needs to be in place:

- Persons must be aware of and acknowledge the work at height risk assessment for work at height hazards and risks expected for the site;
- Discuss the advantages and disadvantages of the various options available for fall prevention, low level work restraint, fall protection, and fall arrest systems.
- Discuss a guideline for work at height audits to ensure that the FPP is implemented correctly on site.

1. Abbreviations

- **C.R:** Construction Regulations of OHS act 85 of 1993
- **SANS:** South African National Standards
- **SABS:** South African Bureau of Standards
- **PPE:** Personal Protective Equipment
- **FPP:** Fall Protection Plan
- **SOP:** Standard Operating Procedure or **SWP** Safe Worksite Procedures
- **FAS:** Fall Arrest System.
- **MEWP:** Mobile Elevated Work Platforms
- **MBS:** Minimum Breaking Strain.
- **SWL:** Safe working Load (*normally with a safety factor of 10 for PPE i.e. MBS = 22kN/2200kg SWL =220kg or 1500kg and SWL of 150kg*).
- **OHS Act:** Occupational Health and Safety Act 85 of 1993
- **OEM:** Original Equipment Manufacturer.
- **MFS:** Minimum Free Space
- **IWH:** Institute for Work at Height
- **HIRA:** Hazard Identification Risk Assessment

2. Scope of Work

A Fall Protection Plan is a documented plan to identify and evaluate all risks relating to working from a fall risk position, considering the nature of work undertaken, setting out the correct methods to be applied in order to mitigate, eliminate or reduce the risk(s) to acceptable level.

This plan includes a rescue plan and rescue procedures from any of the work at height areas identified.

3. Management Commitment regarding working at heights

Namaqua Engineering has appointed managers, supervisors and other relevant persons to ensure compliance to the document as well as revision as and when required.

4. Gear Control

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Introduction

For safety reasons it is vital that personnel, who intend to use personal protective equipment and other equipment to control the potential fall related risks associated with working at height, are aware of how to use that equipment properly. It is essential that personnel are trained, assessed as competent and authorized which enable them to select, use and maintain PPE or other equipment correctly, and to be aware of limitations, precautions and the dangers of miss use.

Selection of gear/PPE

The risk assessment will indicate the type of PPE you are going to use because it will differ from task to task.

Inspections

Every person working at height, in a fall risk position, must do a pre-use inspection of all his PPE before work commences. The site supervisor must control and supervise these inspections.

The site supervisor shall also inspect all the work at height equipment on long duration jobs and or harsh environment work as per Risk Assessment e.g. continues hot metal work etc. This inspection shall be done monthly and record kept thereof.

The 3-monthly full inspection shall be carried out by an accredited contracting company which will issue a certificate as proof thereof. These records will be kept by the supervisors on file for scrutiny.

The supervisor must correctly schedule these inspections to minimise down time without affecting the safety of the users.

Rejected Equipment

- Rejected, suspect or sub-standard equipment must be taken out of service immediately and marked clearly (with a red tag) to prevent re-use.
- This suspect/rejected equipment must be taken to the equipment controller for further inspection and repair or disposal.
- If an item has fallen from height or has absorbed a shock load it must be marked clearly and taken out service.

Identification

- Equipment used for work at height must be correctly identified, certified, marked in line with **SANS 50365** procedures.
- Must be marked with a suitable method not having a harmful effect on the material.

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Maintenance

A Spec Sheet addressing the use, storage, maintenance (inspections), limitations on safety harnesses is in place.

5. Medical Fitness

Employees required to work at heights are assessed by a Registered Occupational Practitioner on an annual basis and a Certificate of Fitness issued as proof thereof. The examination will be conducted by the guidelines as stipulated by the Man Job Specification for Working at Heights.

5. Work site Procedures

Planned Task Observations need to be done to make sure employees are working according to Safe Operating Procedure for Working at Heights.

6. Anchor Points

A substantial structure such as a beam, column or similar substantial portion of the structure, selected as an anchor point where no dedicated anchor point is available may be use as an anchor point.

Steel angle sections, cold formed sections, cable trays, guard rail sections and the like shall not be used as anchor points.

7. Drop Zone

- Clearly marked drop zones need to be demarcated where working at heights activities are taking place.
- Drop zone demarcating needs to be a third of the height from the base of the activities at height.

8. Guardrails

Guardrails are often the best and most convenient means of fall protection. Where possible and practical, guardrails must be installed as per risk assessment recommendation:

- Along the open edges of roofs and floors;
- on formwork, scaffolds, and other work surfaces;
- openings in floors and roofs;
- wherever workers are exposed to the risk of falling.

Guardrails and/or Handrails are not considered to be safe anchor points for fall arrest equipment. Sometimes guardrails have to be removed to land material or make installations along floor or roof edges. The open edge should be roped off and

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marked with warning signs. Workers inside that area must wear fall protection and use the correct restraint or fall arrest system as identified in risk assessment.

9. Discharge of Material from heights

No material or equipment may be thrown from heights. Alternatively such material must be lowered with cranes or hoists, or carried down by hand. If there is a need to hoist equipment/ material, all necessary precautions should be taken to secure them during the activity.

All the correct safety signs must be in place and the correct barricade and or access procedure must be followed at all times to prevent unauthorised entry to the site.

10. Workers working above you

1. No work can be done directly below other workers.
2. Ensure that your team is protected by either erecting the correct barricade with the appropriate signage in the area above you to prevent workers working above you OR erect the barricade on the same level as your workers to keep your workers out of the drop zone while they are working.

11. Lifelines

Lifeline Anchorage Inspection:

- Make sure that anchors can withstand a load 10 times heavier than the weight of the person using the fall-arrest system.
- Check that lifelines are securely attached to anchors before using the system.
- Make sure that, wherever possible, only one lifeline is attached to each anchor.
- Ensure that lifelines are securely attached to solid anchor points.
- Whenever possible, attach only one lifeline to each anchor.
- Never anchor to bundles of material that may be moved or depleted through use.
- Do not anchor to exposed rebar unless embedment length is adequate.

Lifeline Inspection:

- Lifelines must be at least 16mm diameter polypropylene or material of equal strength.
- Inspect lines from end to end before installation.
- Look for cuts, burns, fraying, and chemical or heat damage.
- Signs of decreased diameter may indicate that line has been involved in a fall arrest and should be discarded.

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12. Workers Working Below You

Ensure that proper barricade with the appropriate signage is erected in the drop zone. Do not allow any workers below you in the drop zone.

13. Emergency and Rescue Procedure

- All supervisors (or persons in charge of a group of workmen) are familiar with the rescue from height procedures.
- Supervisor onsite must assess the situation and decide on the correct rescue procedure to be followed.
- These procedures need to be practiced by drills conducted, gaps identified and closed out.

14. Mobile Elevated Working Platform (MEWP's) & Man Cages

- All MEWP users must make use of work restraint or Fall Arrest equipment.
- It is critical that users of MEWP's lifts and other mobile lifting machines do complete full daily inspections and function testing before works starts.
- These inspections must be in line with the manufacturer's recommendations contained in the Operation and Safety Manual of each lifting machine or platform.

15. Access to Large construction equipment/ mobile plant:

To climb on and off construction equipment safely, always maintain three points of contact. That means two hands and one foot or two feet and one hand on the equipment at all times.

- Break 3-point contact only when you reach the ground, the cab, or a stable platform.
- Mount and dismount facing the equipment.
- Climb on and off only when the equipment is stationary.
- Use the parts designed by the manufacturer for mounting and dismounting—steps, running boards, traction strips, footholds, handgrips, etc.
- Keep these parts clear of mud, snow, grease, and other hazards that can cause slips, trips, or falls.

16. Roof top work OR Fragile surface work OHS Act: General Safety Regulations section 8.5

Where roof work is being performed on a construction site, the site supervisor shall ensure that in addition to the requirements set out in section 8 of OHS Act: General Safety Regulations, it is furthermore indicated in the fall protection plan:

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1. No Roof work OR Fragile Surface work can be done without a proper Risk Assessment by a competent person. All roofs and other unknown surfaces or platforms should be treated as a fragile surface until the risk assessment has been completed.
2. Site supervisors to be trained in applicable rescue procedures;
3. The site supervisor on site must also ensure the following:
 - 3.1 that the roof work has been properly planned and communicated;
 - 3.2 that the roof erectors are competent and trained to carry out the work;
 - 3.3 that no employees are permitted to work on roofs during inclement weather conditions or if weather conditions are a hazard to the health and safety of the employees;
 - 3.4 that prominent warning notices are to be placed where all covers to openings are not of sufficient strength to withstand any imposed loads.
 - 3.5 that proper anchor points are identified and communicated.
 - 3.6 that proper fall arrest equipment is installed by a competent person to prevent or catch a worker from falling to the level below.

17. Fall Arrest Equipment & Inspections

Consideration in the selection of an anchor point should minimally include:

- Anchor points that can be identified for workers by a qualified person.
- A not lower than shoulder level.
- Horizontal lines for lateral protected mobility, e.g. pendulum fall.

Lifeline Inspection

1. Vertical lifelines should be at least 16mm-diameter polypropylene or other material of equal strength.
2. Inspect lifelines from end to end before installing them by the site supervisor.
3. Check for wear, abrasion, cuts, and burns. On polypropylene lifelines, check for deterioration from the sun's ultraviolet light.
4. Lifeline should be discarded is any damage becomes apparent.

Fall Arrest Equipment Inspection

Personal fall arrest systems shall be inspected for mildew, wear, damage and other deterioration, and defective components shall be removed from service if their strength or function may be adversely affected.

- Every 3 months by an accredited company who will issue a certificate of inspection.
- On a daily bases by the by the user visual before use.

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Using a Harness

Our company only uses double lanyard full body harnesses. Follow manufacturers' instructions for wearing harnesses. These instructions are kept so employees can inspect them when requested.

Every time a full-body harness is used the following must be checked:

- Carefully inspect the harness for defects.
- Hold the harness by the back D-ring and shake it so all straps fall in place.
- Slip the straps over your shoulders so the D-ring is in the middle of your back.
- Connect the chest and/or waist straps. These straps should fit snugly.
- Reach between your legs and connect one long strap to the buckle or closure on your thigh. Repeat with the second strap.
- After you connect both straps, pull them tight. The harness should be snug but let you move freely.
- Connect the harness to the anchor point. Make sure your anchor point is approved for the way you will use it. Never use a harness that has already been in a fall.

It may be advantageous in some circumstances to locate the lanyard or tie-off attachment of the harness as near to the body's centre of gravity as possible to reduce the whiplash and other trauma when a fall is arrested. This also facilitates moving legs upward and head downward while suspended.

Fall Arrest Standard

Where a worker is exposed to the hazard of falling to a lower level the worker shall wear a full body double lanyard safety harness and lifeline (where necessary) adequately secured to a fixed support and so arranged that the worker cannot fall freely for a vertical distance of more than 1.5 meters; and

The fall arresting system described shall,

- Have sufficient capacity to absorb twice the energy and twice the load that under the circumstances of its use may be transmitted to it, and
- Be equipped with a shock absorber or other devices to limit the maximum arresting force.

When to Wear Fall Arrest

- When a worker is exposed to a risk of falling to a level below;
- Unprotected sides or edges;
- Roof work;
- Aerial Platform cradle;
- Scaffolding or Ladder;
- Man-cage;

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Maintenance of Fall Arrest Equipment

Fall arrest equipment used must be used and maintained according to the manufacturer's recommendations:

1. Harnesses should be stored in a clean and dry area and should not be exposed to excessive heat, sunlight or corrosive materials.
2. When cleaning the harness use warm water and mild soap to remove grease and dirt. Excess moisture should be removed with a clean dry cloth. Rinse the soap solution with water and hang to dry.
3. All harness which has been subject to a fall should be removed from service immediately until inspected by a qualified person.

Straight and Extension Ladders

Extension ladders, when extended, should always be erected so that the upper section is resting on the bottom section and have sufficient overlap to transmit all forces safely from one section to the next.

- Only one person at a time may use or work from a single ladder.
- Always face the ladder when ascending or descending it.
- Keep three limbs on the ladder at any one time, i.e. both hands and one foot or both feet and one hand.
- Carry tools in a tool belt, pouch or holster, not in your hands, so you can keep hold of the ladder.
- Wear fully enclosed slip resistant footwear when using ladder.
- Do not climb higher than the third rung from the top of the ladder.
- When working from a ladder, always work within an easy arm's reach from the ladder.
- Don't "walk" a ladder whilst standing on it. Get down off the ladder to move it to another location.
- Do not use a ladder or step ladder if there is a missing or a weakened, broken or otherwise defective rung or tread, or a broken or defective stile; or any rung or tread depends for its support solely on nails, spikes, or other similar fixing device.
- Only a "trestle ladder" shall be used to support a plank upon which a person has to work.
- Ladders made by fastening cleats across a single rail or stile shall not be used.
- No metal ladder and no ladder reinforced with wire shall be used in the vicinity of any electrical conductor or of any electrified equipment or apparatus that may result in a person receiving an electric shock.
- Ladders shall not be joined together to form a longer ladder.
- The user should ensure that the ladder is strong and long enough for the task.
- Do not set a ladder up on a scaffold.

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- Ladders shall be securely fixed at the top. If it is not possible to secure a ladder, then a person should stand at the base of the ladder and secure it manually against slipping.

18. Review of plan

The fall protection plan developer will review and give feedback on the fall protection plan to the General Manager annually and after every major incident, fatality or change of work scope.

Statement of Company Policy

Namaqua Engineering is dedicated to the protection of its employees from on-the-job injuries. All Namaqua Engineering employees have the responsibility to work safely. The purpose of this plan is:

1. To supplement our standard safety policy by providing safety standards specifically designed to cover fall protection on the job and;
2. To ensure that each employee is trained and made aware of the safety provisions which are to be implemented by this plan prior to the start or erection.

This Fall Protection Plan addresses the use of other than conventional fall protection at a number of areas on the project, as well as identifying specific activities that require non-conventional means of fall protection. These areas include:

1. Connecting activity (point of erection).
2. Leading edge work.
3. Unprotected sides or edge.

This plan is designed to enable Namaqua Engineering and its employees to recognize the fall hazards on this job and to establish the procedures that are to be followed in order to prevent falls to lower levels or through holes and openings in walking/working surfaces.

Each employee will be trained in these procedures and strictly adhere to them except when doing so would expose the employee to a greater hazard. If, in the employee's opinion, this is the case, the employee is to notify the Construction Supervisor of the concern so that the issue is addressed before proceeding.

Safety policy and procedure on any one project cannot be administered, implemented, monitored and enforced by any one individual. The total objective of a safe, accident free work environment can only be accomplished by a dedicated, concerted effort by every individual involved with the project from management down to the last employee. Each employee must understand their value to the company, the costs of accidents; the objective of the safety policy and procedures; the safety rules that apply to the safety policy and procedures; and compliance of their safety policy and procedures. If for any reason an unsafe act persists, strict enforcement will be implemented. It is the responsibility of the Construction Manager to implement

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this Fall Protection Plan. The Construction Supervisor is responsible for continual observational safety checks of the work operations and to enforce the safety policy and procedures. The Construction Supervisor also is responsible for correcting any unsafe acts or conditions immediately. It is the responsibility of the employee to understand and adhere to the procedures of this plan and to follow the instructions of the Construction Supervisor. It is also the responsibility of the employee to bring to management's attention any unsafe or hazardous conditions or acts that may cause injury to either themselves or any other employees.

Fall Protection Systems To Be Used

Where conventional fall protection is not feasible or creates a greater hazard at the leading edge and during initial connecting activity, we plan to do this work using a safety monitoring system and expose only a minimum number of employees for the time necessary to actually accomplish the job.

Only individuals with the appropriate experience, skills, and training will be authorized as designated erectors. All employees that will be working as designated erectors under the safety monitoring system shall have been trained and instructed in the following areas.

1. Recognition of the fall hazards in the work area (at the leading edge and when making initial connections-point of erection).
2. Avoidance of fall hazards using established work practices which have been made known to the employees.
3. Recognition of unsafe practices or working conditions that could lead to a fall, such as windy conditions.
4. The function, use, and operation of safety monitoring systems, guardrail systems, body
5. Harness systems, control zones and other protection to be used. Double lanyard safety harnesses must be used at all heights of 1.8m or greater.
6. The correct procedure for erecting, maintaining, disassembling and inspecting the system(s) are to be used.
7. Knowledge of construction sequence or the erection plan.

A conference will take place prior to starting work involving all members of the erection crew, crane crew and supervisors of any other concerned contractors. During the pre-work conference, erection procedures and sequences pertinent to the job will be thoroughly discussed and safety practices to be used throughout the project will be specified. Further, all personnel will be informed that the controlled access zones are off limits to all personnel other than those designated erectors specifically trained to work in that area.

Risk Assessment

A comprehensive risk assessment for working at heights is available and should be read in conjunction with this Fall Protection Plan.

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Employee's Medical Fitness

The evaluation for the medical fitness for employees to work at a fall risk position excludes the following:

- Epilepsy;
- Poor balance;
- Uncontrolled hypertension;
- Uncontrolled diabetes;
- Vision defects;
- Fear of heights;
- Fear of confined spaces;

The original medical certificate is kept at the OMP who issue a certificate of fitness to Namaqua Engineering. These records are available for scrutiny at our offices and in the relevant safety file on site.

Training

All persons working from a fall risk position will be trained by an accredited service provider and issued with a training certificate valid for the period stipulated on the certificate. Copies of these certificates will be kept in the site safety file and open to inspection. Persons will re-attend the training when the certificate expires and will not be allowed to work from a fall risk position without a valid certificate.

Record of the said training is kept on a training matrix by the Namaqua Engineering training officer.

Safety Monitoring System

A safety monitoring system means a fall protection system in which a competent person is responsible for recognizing and warning employees of fall hazards. The duties of the safety monitor are to:

1. Warn by voice when approaching the open edge in an unsafe manner.
2. Warn by voice if there is a dangerous situation developing which cannot be seen by another person involved with product placement.
3. Make the designated erectors aware they are in a dangerous area.
4. Be competent in recognizing fall hazards.
5. Warn employees when they appear to be unaware of a fall hazard or are acting in an unsafe manner.
6. Be on the same walking/working surface as the monitored employees and within visual distance of the monitored employees.
7. Be close enough to communicate orally with the employees.
8. Not allow other responsibilities to encumber monitoring.

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The safety monitoring system shall not be used when the wind is strong enough to cause loads with large surface areas to swing out of radius, or result in loss of control of the load, or when weather conditions cause the walking/working surfaces to become wet or slippery.

Control Zone System:

A controlled access zone means an area designated and clearly marked, in which leading edge work may take place without the use of guardrail, safety net or personal fall arrest systems to protect the employees in the area.

Control zone systems shall comply with the following provisions:

1. When used to control access to areas where leading edge and other operations are taking place the controlled access zone shall be defined by a barricade or by any other means that restricts access. When barricades are used, they shall be erected not less than 2m from the leading edge.
2. The barricade shall extend along the entire length of the unprotected or leading edge and shall be approximately parallel to the unprotected or leading edge.
3. The control line shall be connected on each side to a guardrail system.
4. A Standard Operating Procedure on Barricades and Barriers is available and should be read in conjunction with this.

Holes:

All openings greater than 300mm x 300mm will have perimeter guarding or covering. All predetermined holes will be covered. Prior to cutting holes on the job, proper protection for the hole must be provided to protect the workers. Perimeter guarding or covers will not be removed without the approval of the Construction Supervisor.

Implementation of Fall Protection Plan

The following is a list of the products and erection situations on this job:

1. Erection/installation of structural steelwork including the roof structure.

Conventional Fall Protection Considered for the Point of Erection or Leading Edge Erection Operations

Personal Fall Arrest Systems

Leading edge erection and initial connections are conducted by employees who are specifically trained to do this type of work and are trained to recognize the fall hazards. The nature of such work normally exposes the employee to the fall hazard

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for a short period of time and installation of fall protection systems for a short duration is not feasible because it exposes the installers of the system to the same fall hazard, but for a longer period of time.

1. It is necessary that the employee be able to move freely without encumbrance in order to guide the steel sections into their final position without having lifelines attached which will restrict the employee's ability to move about at the point of erection.
2. A typical procedure requires two or more workers to manoeuvre around each other as a steel member is positioned to fit into a structure. Suitable fall arrest systems that avoid persons becoming entangled should be used. In this specific erection sequence and procedure, retractable lifelines do not solve the problem of two workers becoming tangled. In fact, such a tangle could prevent the lifeline from retracting as the worker moved, thus potentially exposing the worker to a fall. Also, a worker crossing over the lifeline of another worker can create a hazard because the movement of one person can unbalance the other. In the event of a fall by one person there is a likelihood that the other person will be caused to fall as well.
3. Employees tied to a lifeline can be trapped and crushed by moving structural members if the employee becomes restrained by the lanyard or retractable lifeline and cannot get out of the path of the moving load. The sudden movement of a load being raised by a crane can be caused by a number of factors. When this happens, a worker may immediately have to move a considerable distance to avoid injury. If a tied off harness is being used the worker could be trapped. Therefore, there is a greater risk of injury if the worker is tied to the structure for this specific erection sequence and procedure.
4. The competent person, who can take into account the specialized operations being performed on this project, should determine when and where a designated erector can or cannot use a personal fall arrest system.

The factors causing sudden movements for this location include:

(A) Cranes

1. Operator error;
2. Site conditions (soft or unstable ground);
3. Mechanical failure;
4. Structural failure;
5. Rigging failure;
6. Crane signal/radio communication failure.

(B) Weather Conditions

1. Wind (strong wind/sudden gusting) - a particular problem with steel members of large surface areas.
2. Rain (visibility);
3. Fog (visibility);
4. Cold causing slowed reactions or mechanical problems.

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(C) Structure/Product Conditions

1. Lifting Eye failure;
2. Bearing failure or slippage;
3. Structure shifting;
4. Bracing failure;
5. Product failure.

(D) Human Error

1. Tag line hang-up;
2. Incorrect or misunderstood crane signals;
3. Misjudged elevation of member;
4. Misjudged speed of member;
5. Misjudged angle of member.

Other Fall Protection measures considered for this job.

The following is an explanation of other fall protection measures available and an explanation of limitations for use on a particular construction site. If during the course of erecting the structure an employee sees an area that could be erected more safely by the use of other fall protection measures, the Construction Supervisor should be notified.

Vehicle mounted platforms:

1. A MEWP that will reach areas that are erected over other levels.
2. The leading edge of the structure is usually over a lower level of the structure.
3. Care must be taken that MEWP does not interfere with the safe swinging of a load by the crane, and that
4. Power lines and surrounding site work allow for the safe use of a vehicle mounted platform.

Fall Arrest Equipment Inspections

All fall arrest equipment used by Namaqua Engineering will be inspected and tagged every three months with the current colour tag. A new test certificate will be issued by the accredited service provider each time the fall arrest equipment is tagged. Inspection records will be kept on file on site.

Enforcement

Constant awareness of and respect for fall hazards, and compliance with all safety rules are considered to be conditions of employment. The Construction Manager and Construction Supervisor reserve the right to issue disciplinary warnings to employees, up to and including termination, for failure to follow the guidelines of this plan.

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Accident Investigations

All accidents that result in injury to workers, regardless of their nature, shall be investigated and reported. It is an integral part of any safety program that documentation takes place as soon as possible so that the cause and remedial action can be identified to prevent a reoccurrence.

In the event that an employee falls or there is some other related, incident occurs, this plan shall be reviewed to determine if additional practices, procedures, or training need to be implemented to prevent similar types of falls or incidents from occurring.

Changes to Plan

Any changes to the plan will be approved by the Construction Manager. Workers shall be notified and trained, if necessary, in the new plan. A copy of this plan and all approved changes shall be maintained at the construction site.

RESCUE PROCEDURE

The following rescue procedures are the preferred methods to be used if a rescue is necessary. The preferred rescue method for any task performed must be identified in the mini-HIRA conducted for the task. All rescues must be done under the supervision of the Construction Supervisor

Mobile Elevated Work Platform Rescue—If an elevating work platform (MEWP) is available on site and the suspended worker can be reached by the platform, follow the procedure below.

1. Bring the MEWP to the accident site and use it to reach the suspended worker.
2. Ensure that rescue workers are wearing full-body harnesses attached to appropriate anchors in the MEWP.
3. Ensure that the MEWP has the load capacity for both the rescuer(s) and the fallen worker.
4. Position the MEWP platform below the worker and disconnect the worker's lanyard when it is safe to do so. When the worker is safely on the MEWP, reattach the lanyard to an appropriate anchor point on the MEWP if possible. If it is necessary to cut the lanyard the second lanyard must be used to re-attach the worker to the MEWP.
5. Lower the worker to a safe location and administer first aid. Treat the worker for suspension trauma and any other injury if necessary. Do not lie the

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patient flat and ensure that the legs are always below the level of the hips. Place in a seated position with the knees bent if possible.

Rescue from Work Area or Floor Below—If the fallen worker is suspended near a work area and can be safely reached from the floor below or the area from which they fell, use the following procedure.

1. Ensure that rescuers are protected against falling.
2. If possible, securely attach a second line to the fallen worker’s harness to help rescuers pull the fallen worker to a safe area. You will need at least two strong workers to pull someone up to the level from which they fell.
3. Take up any slack in the retrieving line to avoid slippage.
4. Once the worker has been brought to a safe location, administer first aid and treat the person for suspension trauma and any other injury.
5. Ladders must be used to reach a fallen worker from the floor below if possible and where a MEWP cannot be used.

Bosun’s Chair (Basket) Rescue—If a worker has fallen and is suspended in an inaccessible area, you may need to perform a basket rescue.

1. Notify the crane operator right away to position the crane to attach the basket.
2. While the basket is being attached, the crew leader checks that all safety rigging is done and all the required safety equipment is available.
3. With two rescuers in the basket, hoist it to a position that is above and as close as possible to the fallen worker. A designated worker on the ground guides the basket with a tag line. The designated worker must make sure that when the rescue basket reaches the right elevation. Rescuer 1 gets into a position to reach the fallen worker without endangering himself. When doing this, rescuer 1 must be tied-off at all times to either the structure or the rescue basket.
4. Rescuer #2, attaches an extra lanyard to the line if required.
5. Rescuer 1 assesses the fallen worker for injuries and then guides the fallen worker into the rescue basket, or lowers the basket to the ground with the fallen worker attached to it. Rescuer 2 assists in this process.
6. Once the fallen worker has been brought to a safe location, administer first aid as described. Treat the person for suspension trauma and any other injury.
7. Arrange transportation to hospital if necessary. A designated worker must transport the injured worker to hospital if transported.

Rescue must come rapidly to minimize the dangers of suspension trauma.

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After a fall:

- Workers should be trained to try to move their legs in the harness and try to push against any footholds.
- Workers hanging in a harness should be trained to try to get their legs as high as possible and their heads as close to horizontal as possible (this is nearly impossible with many commercial harnesses in use today).
- If the worker is suspended upright, emergency measures must be taken to remove the worker from suspension or move the fallen worker into a horizontal posture, or at least to a sitting position.

For Harness Rescues:

- The victim should not be suspended in a vertical (upright) posture with the legs dangling straight.
- Victims should be kept as nearly horizontal as possible, or at least in a sitting position (lift legs).
- Rescuers should be trained that victims who are suspended vertically before rescue are in a potentially fatal situation. If the person is conscious they must be encouraged to move their legs vigorously to improve circulation.
- Rescuers must be aware that post-rescue death may occur if victims are moved to a horizontal position too rapidly.

First Aid Treatment of Person:

Once the affected person has been removed from the harness standard First Aid ABC (Airway, Breathing, Circulation) must be applied.

- If the patient is conscious at this time they must be placed in a sitting position for at least 30 minutes or until medical help arrives.
- Conscious patients must be encouraged to move their legs about as much as possible to improve circulation.
- If the patient is unconscious they must be immediately be placed in a supine position (lying down) to improve return blood flow to the brain. .
- Assessment of airway and cardiac status should follow immediately as well as appropriate lifesaving measures including CPR if necessary.
- Medical help must be summoned immediately in the cases of unconscious persons, the medical status of the patient must be relayed to the medical personnel by the rescue team.
- Patients must not be left alone under any circumstances at this time and must be continually monitored until the necessary medical help arrives.
- If the patient needs to be moved to hospital a team member must accompany the ambulance.

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Changes made to include treatment of suspension trauma.

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Approved.

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Date.

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