WORKING AT HEIGHT HEALTH AND SAFETY PROCEDURE

***SECTION 4*** *Operational Procedures and Guidelines*

PURPOSE

***PROCEDURE***

To provide guidance to control the health and safety risks associated with falls when working at height. Where a contractor has been appointed as Principal to control works on site this procedure shall be adopted as guidance material good practice minimum standard.

GENERAL REQUIREMENTS

### ASSESSMENT OF FALL RISKS

Before work commences an assessment shall be undertaken to identify whether there is a risk of falling.

If a task involving a fall hazard has been identified, the risk of a fall can be assessed by determining:

 The likelihood of a fall occurring;

 The potential distance a person could fall; and

 The extent of harm that a person could receive in the event of a fall.

### IDENTIFYING FALL HAZARDS

The tasks detailed below provide examples of work activities and situations that would typically expose a worker to the risk of falls.

 Tasks conducted near an unprotected perimeter edge (lack of physical barriers such as guardrails);

 Tasks conducted near a hole, shaft or pit into which personnel could fall (pile holes, service pits, trenches etc.);

 Tasks conducted on unstable surfaces (areas where there is potential for ground collapse such as poorly compacted or

backfilled ground or surfaces like on top of stacks of building material/pallets which are unstable);

 Tasks conducted on fragile surfaces (this includes surfaces such as rusty metal roofs, cement sheeting roofs, fibreglass sheeting roofs, skylights etc.);

 Tasks conducted on a sloping or slippery surface where it is difficult for personnel to maintain their balance (e.g. sloping embankments, glazed tiles etc.);

 The way in which personnel are accessing/aggressing work area; and

 Tasks conducted on any structure or plant being constructed or installed, demolished or dismantled, inspected, tested, maintained, repaired or cleaned.

HIERARCHY OF FALL CONTROLS

There is a specific, preferred order (or hierarchy) of risk-control measures to control identified fall hazards, ranging from the most effective to the least effective that must be applied. The preferential order of controls is:

#### Level 1 Controls: Undertake the work on the ground or from a solid construction

Eliminating the need to work at height is the most effective way of protecting the safety of workers. Consideration of the potential

risks of falls from height early in the design stage can result in the elimination or better control of such risks for workers. Where this is not possible, one way to minimise fall risks at the design stage is to integrate fall prevention systems into the design. This can improve safety in both the construction phase and in subsequent maintenance tasks.

Examples of elimination include:

 prefabricating roofs at ground level

 prefabricating wall frames horizontally, then standing them up

 using remote release clutches for crane-lifted loads positioned at height

 designing permanent guardrails or other forms of edge protection (e.g. parapet walls) for permanent fall prevention on roofs

#### Level 2 Controls: Undertake the work using a passive fall prevention device

Examples of passive fall prevention devices include:

 roof safety mesh

 fall protection covers

 guard railing

 perimeter screens / mesh

 temporary work platforms, i.e. scaffolds, elevating work platforms, mast climbing work platforms and work boxes.

#### Level 3 Controls: Undertake the work using a work positioning system

Examples of Work Positioning Systems:

 travel restraint systems

 industrial rope access systems

#### Level 4 Controls: Undertake the work using a fall injury minimisation system

A fall injury minimisation system means equipment, material or a combination of equipment and material that is designed to

prevent, or reduce the severity of injury to a person if a fall from one level to another does occur.

Examples of fall arrest systems include:

 catch platforms

 fall-arrest systems

#### Level 5 Controls: Undertake the work from ladders

Generally ladders should only be used for gaining access to and egress from a work area. Whilst ascending or descending a ladder it is important that three points of contact are maintained at all times.

Ladders may only be used when working at a height where other methods are not practicable (as per hierarchy of controls). If ladders are to be used the following measures must be adhered to:

 Ladders used must be industrial grade not domestic;

 Do not stand on a rung closer than 900mm from the top of a ladder (this includes when working and stepping off/on);

 Set ladders up on stable footings and fix at top and bottom;

 Do not use ladders where it is possible to contact power lines;

 Metal ladders should not be used when working with live electrical installations;

 Do not set ladders up near an open edge;

 Always maintain 3 points of contact with ladder (do not use hand tools/equipment that are designed to be used with 2 hands);

 Do not carry out tasks on ladders where vision is impaired such as arc welding, oxy cutting etc.;

 Do not over reach whilst on a ladder;

 Do not work over other people;

 Only 1 person is permitted to work off a ladder at the same time.

PREVENTION OF FALLS INTO EXCAVATIONS OR PITS

The responsible person shall ensure that all holes or penetrations are covered to prevent persons falling through these openings.

Fall protection covers must be designed so as to be capable of supporting the impact of a person falling onto it (minimum of 15 KN) and must be secured so as they do not move.

Fall protection covers could be made of solid sheeting (timber or plywood) or mesh. They must be securely fastened over the hole and may be marked with the following Danger Sign if applicable.



SCAFFOLDING

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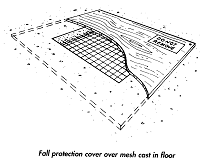
Scaffolds shall be designed in accordance with AS / NZS 1576.1:1995 (Scaffolding Part 1 General Requirements) and erected, altered and dismantled in accordance with AS/NZS 4576:1995 Guidelines for Scaffolding.

All personnel involved in scaffolding work should hold the appropriate certificate of competency in accordance with the National Occupational Health and Safety Certification Standard for Users and Operators of Industrial Equipment (SB Basic Scaffolding, SI Intermediate Scaffolding and SA Advanced Scaffolding).

A Scafftag (as shown below) or similar system shall be used to indicate that a scaffold is completed, ready for use and displayed at the access point. Work on scaffolding must only be undertaken on completed scaffolding, unless the work involves the erection or dismantling of the scaffolding.



Scaffolding that is being erected or dismantled shall display an appropriate sign and install a hard barrier, placed at potential entry points, to prevent unauthorised access to the work area. A recommended design and size for the scaffolding signage is displayed below.

The scaffolding supervisor shall ensure that a handover certificate is issued for scaffolding over 4 metres to verify that the scaffolding is ready for use and compliant with AS4576-1995 Guidelines for Scaffolding. A copy of the handover certificate will be retained

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by the project, kept on file and later archived for a period of five years. It is recommended that a register of scaffolds at the workplace also be retained.

When erecting scaffolds, environmental loads particularly the effects of wind and rain should be considered. Environmental loads imposed by wind and rain may be heightened if perimeter containment screens, shade cloth or signs are attached to the scaffold. Any additional loads applied to a scaffold should be checked by a suitably qualified engineer.

***PROCEDURE***

A regular means of scaffolding inspection (by a qualified person) should be conducted in accordance with the risk assessment and no less than every 30 calendar days. Scaffold auditing should also be conducted and where inspection and auditing identifies deficiencies, the scaffold should not be used until corrected.

ELEVATED WORK PLATFORMS

In addition to the general work at height and plant safety requirements and working near overhead services the following methods shall be used whilst undertaking work from an Elevated Work Platforms (EWP) on structures:

 Fall arrest systems or restraint devices, complying with the appropriate part of AS/NZS 1891 and selected in accordance with AS/NZS 1891.4, shall be worn and attached to the anchorage point(s) by everyone in a boom type mobile EWP unless it can be demonstrated that the risk of them being ejected from the platform through a component failure or other eventuality,

 All EWPs shall be fitted with a manual lowering device,

 In the event of either mechanical breakdown or emergency, workers shall use the manual lowering device or request another EWP. Personnel shall not use the rope descent device unless appropriate rescue training has been undertaken and there are no other means of retrieval,

 EWP movement controls should be protected against accidental operation and the dead man control should be tested to ensure that it is operational,

 Personnel shall not enter or leave the platform when elevated except in an emergency.

### REQUIREMENTS FOR OPERATING EWP’S NEAR OVERHEAD POWERLINES

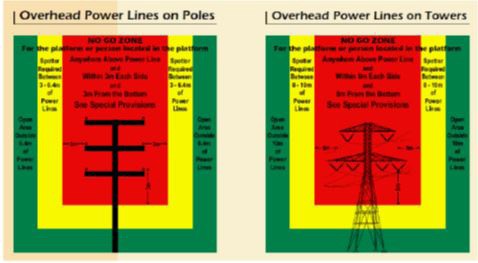
Operators must ensure the following is undertaken prior to commencing work,

 Notify the power company when planning the work,

 Obtain appropriate permits from the power company,

 Do not commence work until a JSA has been completed

Operators should be aware of “No Go Zones” when operating near overhead powerlines (see image below).



### USE OF SCISSOR LIFTS

 That the recommendations in the manufacturer's operation manual are followed;

 Where the task intended for the scissor lift is outside or is not covered by the recommendations in the operation manual, then the machine's suitability for the task should be confirmed by the supplier, manufacturer or a competent person, before the task commences; and

 Where the system of work involves the scissor lift working in proximity to other mobile plant or vehicles, then control measures should be in place to ensure the risks associated with entanglement, collision or collapse are eliminated, before the task commences.

Prior to any task being undertaken the responsible person shall ensure that a JSA has been prepared in consultation with all those who are involved. The JSA should include the identification of all likely hazards (including overturning).

FALL RESTRAINT SYSTEMS

A fall restraint system prevents the user from approaching an unprotected edge on a building or structure. Generally, the system consists of a safety belt or harness that is connected by a lanyard to a suitable anchorage point or static line. The system must be set up to prevent the wearer from reaching the edge.

Where a temporary roof anchor is used as an anchorage for a travel restraint system it must be installed in accordance with the manufacturer’s or designer’s instructions. The roof or other building component to which an anchor is to be attached must be checked by a competent person to verify that it is suitable for supporting the anchor.

It is preferable that travel restraint systems are used in conjunction with other fall prevention methods, such as guardrails, safety nets and catch platforms. Travel restraint systems should conform to the AS/NZS 1891 series or their most recent equivalent.

FALL ARREST EQUIPMENT

Personal fall arrest equipment shall consist of a full body harness connected to a suitable fixed anchor or static line by a lanyard or inertia reel. All fall arrest equipment shall comply with the relevant sections of AS/NZS 1891. In using fall arrest equipment:

 Employees using personal fall arrest equipment must be trained and deemed competent;

 Equipment inspections are to be conducted (by the employee prior to use) regularly (every 6 months as a minimum unless otherwise specified) by a competent person; and

 Six monthly inspections will be documented and recorded on a register.

Personnel must attach one end of the lanyard (energy absorber) or the line of the inertia reel to the top 'D' ring at the back of the harness and the other end to a secure anchorage point on the building or structure.

The anchor point chosen MUST NOT be below the level of the work to be carried out in order to limit possible free fall to 1.8 metres wearing a full harness.

Always consider the potential of the 'pendulum effect' when using a fall arrestor system in a non-vertical position. If a person using an individual fall-arrest system falls, the system may act as a pendulum, and in some situations the user may swing onto the ground (which is called ‘swing down’) or swing back onto the building or structure (which is called ‘swing back’).

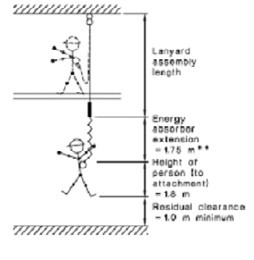
Suggested methods to prevent this include; careful selection of the anchor point and use of two (2) arrestors from different angles. AS/NZS 1891.4:2000 Industrial fall-arrest systems and devices – Part 4: Selection, use and maintenance provides further guidance on inertia reels.

Fall-arrest systems, incorporating a lanyard, should be installed so that the maximum distance a person would free fall before the fall- arrest system takes effect is 2 metres. There should be sufficient distance between the work surface and any surface below to enable the system, including the action of any shock absorber

to fully deploy (See image below). Personal energy absorbers complying with AS/NZS 1891 or most recent equivalent should be used in conjunction with the lanyard.

Harnesses must be properly adjusted as per the manufacturer's instructions. When a fall occurs, the majority of the holding force is on the leg straps, designed to minimise the risk of injury. The waist band and shoulder straps take little load. If the leg straps are loose there is a real risk of injury in the groin area when the leg straps snap upwards in stopping a fall.

Lanyards should not be used in conjunction with inertia reels as this can result in an excessive amount of free fall prior to the fall being arrested.



Fall protection equipment should be stored in a clean, cool, dry location away from direct sunlight, chemical or corrosive fumes. Care should be taken not to store the equipment on the ground.

Safety Equipment should be cleaned regularly. The frequency of cleaning depends on the environmental conditions within which they are used. It is recommended that the cleaning intervals should not exceed 3 months for webbing products. The cleaning process should remove contaminates, including: dirt, dust, paint, grease, oil and chemicals.

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Lanyards should preferably be from the same manufacturer as the harness to ensure compatibility between components. Mismatches can result in the "roll out" of the hook from the "D" ring.

Lanyard hooks should not be connected directly to the static line. A karabiner should be used. The lanyard, when passed around an anchor point, must not be hooked back on itself. Where a lanyard assembly is in use the energy absorber shall be attached to the harness.

The harness and the lanyard must be rated to support the weight of a person during a fall. Harnesses must support a minimum body weight of approximately 120kg. The harness and lanyard manufacturing weight specifications must be checked against the individual using those items prior to donning them and working at height. This is to ensure that the harness and lanyard specifications are appropriate for the person’s body weight. AS/

NZS 1891.4:2000 Industrial fall-arrest systems and devices – Part 4: Selection, use and maintenance provides further guidance on lanyards.

ANCHORAGE POINTS

Where a temporary anchor point is used as an anchorage for a travel restraint system, it must be installed in accordance with the manufacturer’s or designer’s instructions. All anchorages need to be visibly checked prior to use. The building or structure and anchorage points shall be assessed by an engineer, unless it is clear to a competent person that the anchorage system is

structurally adequate. This includes verifying that a client’s system has been appropriately installed or has the necessary approvals in place prior to starting work.

An example of where an engineer may not be required is where an anchorage sling of the correct capacity is secured around

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a solid permanent structure such as a plant room. However, if any doubt exists as to the structural adequacy of the anchorage, an engineer shall make the assessment. If called upon to make the assessment the engineer shall certify in writing that all combinations of loads in a worst case situation can be safely contained by the proposed structure and anchorage points.

The responsible person must ensure that a permanently fixed anchorage is inspected by a competent person, and that it is regularly inspected at no less than six-month intervals if it is permanently fixed and in regular use. If a permanently fixed anchorage is not in regular use, it needs be inspected before it is used.

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Where the load-bearing capacity of anchor points is impaired, the anchor point is required to be taken out of service to prevent its use. When the competent person doing an inspection assesses the anchorage is impaired, they must ensure that:

 the anchorage is not used and is tagged to indicate it is not to be used;

 the repaired anchorage is not used until it is inspected by a competent person who can confirm it is safe to use.

All permanently fixed anchor points certificates are to be kept on record and retained for a period of five years.

INERTIA REELS

An inertia reel can be attached to a suitable anchor or to a static line using a karabiner or a shackle. An inertia reel should only be used in a vertical position with a maximum of 30 degree variation from the vertical. When using an inertia reel a safe working zone shall be calculated to eliminate a potential fall. Where necessary, the inertia reels shall have a light cord attached to enable the wire to be drawn down and shall be installed by a competent person that is familiar with the item being used.

FALL ARREST AND INERTIA REEL RESCUE PLANS

Where work at height is to be conducted in using fall arrest or inertia reels as control measures, a rescue plan must be

completed and communicated to workers. Where an emergency rescue is to be performed, only personnel trained in such procedures are to conduct the rescue. Work at height rescues can only be authorised if emergency response and rescue services are on site and available.

In the event of an emergency at heights, the responsible person (e.g. Chief Warden) shall take the following steps:

 Identify location of person requiring rescue and potential access / egress points;

 Contact Emergency Rescue Services by dialling 111

 Ascertain if any person/s injured – if yes, request Ambulance;

 Assess the ability to rescue the person;

 Initiate rescue if possible and if trained;

 Facilitate emergency service areas;

 Liaise with emergency services and deploy resources as applicable to support emergency personnel.

It is imperative that the rescue of a worker who is suspended in a full body harness should occur promptly. Suspension trauma is a condition whereby a person suspended in a harness in a

substantially upright position may experience blood pooling in the legs. Depending on the susceptibility of the individual, this may lead to loss of consciousness, renal failure and eventually death. In an emergency a Suspension Trauma Safety Strap allows the workers to stand up in their harness to relieve the pressure being applied to the arteries and veins around the top of the legs.

TOOLS AND EQUIPMENT WHEN WORKING AT HEIGHT

Consideration should be given as to what tools and equipment personnel may be required to carry to and from the work place. Wherever possible, mechanical-lifting aids should be used so as to eliminate the possibility of a fall whilst carrying tools and equipment.

Where the potential exists for tools or equipment to fall from the work area, the following protection methods should be considered:

 The use of tool straps attached to the wrist of the worker when using hand tools;

 Areas below the activity shall be barricaded to prevent access;

 Perimeter screens / mesh are used to prevent tools and equipment falling and hitting those below. This may include spotters or sentries to keep people away from hazards being conducted above;

 Kickboards can also be used on scaffold working platforms to prevent items being inadvertently kicked or dropped off a scaffold;

 Drop mats to protected equipment from falling below;

 Tools or equipment buckets or containers;

 Flooring which does not permit tools or equipment to fall through openings etc.

INSPECTION AND MAINTENANCE OF FALL PREVENTION EQUIPMENT

The responsible person shall ensure that all Fall Restraint / Arrest Equipment, e.g. Fall Arrest Harnesses, Inertia Reels, Lanyards and Rescue Equipment, are recorded a Working at Height Equipment Register or similar.

All equipment should be thoroughly inspected prior to each use for serviceability and must not be contaminated with paint, chemicals or marker pens. Fall Restraint / Arrest Equipment should be stored where they will not be damaged, preferably hung above floor level.

As per AS/NZS 1891.4, fall protection equipment users must carry out a full inspection on their gear before and after each use to ensure that the items are in good working order.

The responsible person shall ensure that fall restraint / arrest devices are inspected in accordance with the relevant Australian Standards (AS 1891 Series) and by competent personnel.

Inspection and maintenance results shall be recorded on the Working at Height Equipment Register.

Inspected items should be tagged (coloured preferably) so that the user can identify that it is in service and ready to be used. Inspection tags should not be attached to ‘D’ rings as personnel could accidentally attach a lanyard or inertial reel to the inspection tag.

Guidance on the inspection of belts and harness fall arrest systems and devices is given in Appendix C of AS 1891.4:2000 and guidance on the inspection of fall-arrest devices is given in Appendix D of 1891.4:2000.

If a fall arrest system has been used to arrest a fall or is not working within the manufacturer’s specifications it must be withdrawn from service, tagged out and inspected by a competent person. Equipment deterioration and failure may result in serious injury or death. Any equipment not fit for use must be removed from service immediately, tagged out and reported to the workplace supervisor/manager.

Where it is unsure whether the equipment should be condemned advice from the manufacturer or a manufacturer’s accredited supplier should be sought. This equipment shall have an Out-of- Service Tag placed on it and locked in a container clearly marked “Equipment- Out-of-Service”.

EXCLUSION ZONES AND SIGNAGE

Signage that indicates “Workers Overhead” shall be displayed at prominent locations below the work area. The drop-zone shall be delineated by the supervisor / leading hand using either solid barricading (e.g., those that cannot be walked through or under such as fencing, water barriers etc) or hard barricading (e.g., those erected via scaffolding tubes/stands)

Personnel are not permitted to enter the drop-zone until work has ceased and all tools and materials have been secured and approval has been given by those supervising the work.

TRAINING REQUIREMENTS

All personnel working in an area where there is a potential to fall from height must receive appropriate accreditation/certification training that is specific to the task they are performing. This includes but should not be limited to:

 Scaffolding;

 Rigging / Dogging;

 Operating Elevated Work Platforms / Boom-lifts;

 Using Fall Restraint / Arrest Equipment;

 Fall rescue.

Note: Training for personnel required to use fall restraint/arrest equipment must cover how to inspect, fit, maintain and use each specific item.

#### Records of training

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Persons in control of the workplace shall maintain records of working at heights training and make available during inspections and audits.

REFERENCES

***PROCEDURE***

### WATER NEW ZEALAND PROCEDURES & GUIDELINES:

#### Health and Safety Procedures:

 Contractor Health and Safety Management

 Hazard Identification, Risk Assesment and Control

 Job Safety Analysis

 Confined Space Entry

 Health and Safety Training Program

### LEGISLATION, REGULATION AND STANDARDS

 Health and Safety at Work Act 2015

 Health and Safety in Employment Regulations 1995

 AS / NZS 1576.1:1995 (Scaffolding Part 1 General Requirements)

 AS/NZS 4576:1995 Guidelines for Scaffolding.

 AS 1657 SAA Code for Fixed Platforms, Walkways Stairways and Ladders

 AS 1891 2000 Industrial Fall Arrest

 AS 1892 Portable Ladders

 AS 2550.1 Cranes, Safe Use - General Requirements

 AS 2550.10 Cranes, Safe Use - Elevating Work Platforms

 AS/NZS 1891.1 Individual fall-arrest systems & devices - Safety belts and harnesses

 AS 2626 Industrial Safety Belts and Harnesses - Selection, Use and Maintenance

 AS 4626 Industrial Fall Arrest Devices - Selection, Use and Maintenance

 AS/NZS 1891.4 Individual fall-arrest systems & devices - Selection, Use & Maintenance