JOSOP 405 - Work at Height Standard

Approved 27 February 2008
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1.0 Purpose, Objectives and Scope

1.1 Purpose

The purpose of this standard is to ensure that work at height is performed in a safe and controlled manner.

1.2 Objective

This standard establishes requirements for working at height to prevent falls and reduce the risk of injury at JO.

1.3 Scope

This Work at Height Safe Work Practice standard covers work performed by JO employees and their delegates and contractors within JO operational control.

This standard does **not** cover:

- Rescue techniques for emergency response.
- Safety nets or air bags.
- Specialized techniques such as abseiling (also called rappelling). (See Section 8 – Other Guidance Documents for an abseiling guideline reference.)

2.0 Requirements

1. Exhaust all work-at-grade alternatives before beginning work at height.
2. Hazards associated with working at height shall be identified and mitigated prior to beginning work.
3. Fall hazards must be identified and personnel must be protected by fall prevention or fall protection systems.
4. Personnel performing work-at-height shall be competent in the roles for which they are responsible. Persons working at height must be trained in the proper use, maintenance and inspection of the equipment they will be required to use.
5. Scaffolding must be designed, erected, inspected, labeled and dismantled by competent, trained persons.
6. Work-at-height equipment must be inspected periodically to ensure that it is safe to use.
7. Persons wearing fall-arrest systems must not work alone and must use 100 percent tie off.
8. Rescue Personnel must be trained and competent and have the ability to perform their responsibilities. Rescue Personnel must also have the correct rescue equipment at the work location.

3.0 Terms and Definitions

The following terms and definitions apply to the JO – SWP Work at Height Standard.

100 percent tie off – A control method whereby a person working at height is always connected to an anchor so that they are protected by their fall-arrest system or work-positioning system while ascending, descending, moving point to point, or conducting work activity.

Abseiling – The process of descending on a fixed rope, also referred to as rappelling.

Active Controls – Control methods that rely on the worker to take (or not take) some action to be effectively protected from hazards (for example, properly using a fall-arrest harness). See also Passive Controls.

Anchorage – A component cast or fixed into a building or structure for the purpose of attaching a scaffold or safety line. It can also mean the holding-down system for cantilevered, hanging or suspended scaffolding and platforms.

Edge Protection – A form of guardrail or restraint designed to prevent a person from reaching or falling over an exposed edge.

Fall-Arrest Harness (Safety Harness) – An assembly of interconnected shoulder and leg straps, with or without a body belt, that is used where there is the likelihood of free or restrained fall.

Fall-Arrest System – A system designed to support and hold a person in the event of a fall. A fall-arrest system usually consists of an approved full-body harness, a shock absorbing lanyard or short restraining lanyards or self-retracting lifeline, self-locking snap hooks (or carabineer-type rings) and a number of secure anchorage points.

Fall Prevention – A system designed to prevent a person from falling. Fall prevention typically involves the use of engineering controls, such as railings.

Fall Protection – A method of mitigating the effects on a person who has fallen. Fall protection is typically accomplished through the use of fall-arrest systems. Other methods include safety nets and air bags.

Hierarchy of Controls – The preferred order for the use of control measures that mitigate health and safety risks. The sequence is based on the premise that the best way to control a hazard is to remove it from the workplace instead of relying on affected personnel to reduce exposure.

Ladder – An appliance designed for the purpose of climbing and descending that consists of two long structural members crossed by parallel, equally spaced steps or rungs.

Lanyard – A line used to connect a fall-arrest harness to an anchorage point or static line. A lanyard can include a personal energy absorber.

Limited Approach Boundary – A set distance established to prevent access by most personnel from approaching an exposed live part that poses a shock hazard.

Mobile Elevating Work Platform (MEWP)/Man lift – A machine used for the purpose of hoisting persons within a safety cage to an elevated work site. The complete machine includes the platform, lifting mechanism, and chassis or vehicle, as applicable.

Outrigger – A structure that extends outward from the MEWP to increase stability and provide support for the lift.

Passive Controls – Control methods that do not rely on the worker to take some action for effective protection from hazards. Examples of passive controls are safety cages and railings. See also Active Controls.

Rescue Personnel – Personnel who meet certain competency requirements and who are on call to rescue employees who have fallen from height.

Scaffolding – A temporary structure or framework used to provide a secure working platform, to store or support materials and to provide protection for persons below. Scaffolding may be made of timber, bamboo, steel tubes, aluminum tubes or prefabricated frames.

Self-Retracting Lifeline (SRL) – An inertia reel used to arrest a fall. The SRL attaches to the trolley. The cable in the SRL extends and retracts as the user moves to maintain constant tension between the user and the trolley. In the event of a fall, the SRL will lock to within 45 centimeters (cm) (18 inches) and will usually arrest the fall within 60 cm (24 inches).

NOTE: Self-retracting lifelines should not be used with a shock-absorbing lanyard.

Suspension Trauma – Potentially fatal consequence associated with a worker who has fallen while using a fall-arrest system. Following a fall, a worker may remain suspended in a harness. The sustained immobility may lead to a state of unconsciousness. Depending on the length of time the suspended worker is unconscious/immobile and the level of venous pooling, the resulting condition, orthostatic intolerance, also referred to as "harness-induced pathology," may lead to death.

Work at Height – Work performed where there is potential for a person to sustain injury by falling from one surface to another surface that is not at the same level.

4.0 Roles, Responsibilities and Training Requirements

Roles must be clearly defined, and personnel must meet the training and competency requirements of this standard prior to starting work. JO regulations may specify additional training and competency requirements.

A single individual may fulfill more than one role as long as he or she meets the competency requirements and is able to fully meet multiple responsibilities. When selecting personnel for these positions, consideration should be given to the candidate's level of experience and past performance.

The following roles and responsibilities are specific to work at height and are further defined in the JO – Training Requirements Tool:

- Person conducting work at height
- Safety Standby for fall-arrest systems
- Rescue Personnel for fall-arrest systems
- Inspection Personnel
- Person identifying anchorage points

4.1 Initial Training

Personnel must meet the competency requirements of this standardized safe work practice prior to starting work. Refer to the JO – Training Requirements Tool.

4.2 Refresher Training

Refresher training must be provided as follows:

- As required by applicable regulations or JO policy
- As needed when identified by: verification, inspections, incidents or audits

5.0 Standard Instructions

When considering job tasks that involve work at height, always consider whether there is a viable alternative to working at height. Work at height that requires personal fall protection requires special procedures and equipment and must be performed only by personnel who are trained, equipped and competent in performing this type of work.

Where feasible, eliminate the need for elevated work through design or facility modifications or through the installation of permanent platforms with necessary fall protection provided (handrails, toe boards, drop bars, etc.). The Chevron Safety in Designs Manual (3.80MB) provides guidelines for safe facility design and cost-effective recommendations for meeting the guidelines.

5.1 Assessing and Managing Hazards

Work at height must be permitted and managed in accordance with the *JO - Managing Safe Work Process*. Prior to conducting work at height, competent personnel must conduct a hazard analysis to identify the potential hazards associated with the work at height and determine the controls necessary to ensure the work at height can be performed safely. The hazard analysis must be done regardless of whether fall protection already exists. The analysis must include, but is not limited to, the:

- Physical capabilities (and competency) of the workers.
- Likelihood of falling. If a fall is likely, then a means to prevent a fall must be put in place. If fall prevention is not possible, adequate fall protection must be provided.
- Risk of injury to a person if a person falls.
- Risk of falling objects to workers below.
- Work activity (the proposed work at height).
- Obtaining access to, or egress from location (for the proposed work at height).
- Equipment to be used (for example, ladders or MEWPs) and the hazards associated with using it.
- Duration of the work.
- Location of the work activity (to determine the presence of hazards).
- Work environment (weather conditions, lighting, space, etc.).
- Condition and stability of the existing work surfaces.
- Potential fall path.
- Proximity to electrical conductors. Overhead power lines pose a risk of electrocution to personnel who inadvertently touch the conductors or who simply work too close to them. For unqualified electrical persons, the limited approach boundary distance for 230 kilovolt (kV) conductors is 13 feet (4 meters).

- Load-bearing capacity of roofs. Facilities shall use the assistance of a competent person to determine the load-bearing capacity of the roofs of structures where access is required. Where access is required to a part of the roof, only that part of the roof used for access needs to be assessed, as long as the designated access way is clearly marked and non-designated areas are protected from personnel access.
- Hazards introduced by the use of control measures must also be considered.
- Emergency procedure(s) required in the event of an incident.

One or more control measures may be used to eliminate or control hazards. A decision logic flowchart to aid in determining work-at-height control measures is provided in Appendix A: Flowchart for Determining Work at Height Control Measures. Elimination of hazards is the most desirable method of hazard control, and passive controls are preferred over active controls. The preferred order is as follows:

- Elimination – for example, performing work at ground level instead of at height.
- Substitution – for example, using a MEWP instead of a ladder.
- Engineering controls – for example, installing stairs instead of using vertical ladders or safety railings.
- Administrative policies and procedures – for example, requiring a person to act as a Safety Standby when the person who is working at height is wearing a harness.
- Personal protective equipment (PPE) – for example, providing fall-arrest systems. PPE should be used only as a last resort when other control measures have failed to control the risk adequately or in an emergency response.

5.2 Documentation

5.2.1 Permit to Work

A Permit to Work is required when conducting the following:

- Erecting, modifying and/or dismantling scaffolding.
- Work requiring the use of personal fall arrest systems (e.g. harnesses, lifelines, etc.).
- Other work at height associated with potential risk as identified.

Permit to work shall be performed in accordance with the JO – Permit to Work Standard.

5.2.2 Additional Work Certificates

Other high-risk work may be in progress on the jobsite when work at height takes place. Determine whether additional work permits or certificates or documentation is needed based on the hazard analysis.

5.2.3 Contractors

Contractors shall use JO's procedures unless they have been reviewed by JO (usually through the CHESM process) to use their own procedure(s).

5.3 General Requirements

The hazard analysis shall be performed in accordance with the JO Hazard Analysis Procedure and will identify significant, potential hazards and identify and evaluate precautions to ensure that work may be conducted safely.

The hazard analysis shall identify control measures that reduce the potential for injury to personnel working at height. These control measures fall into two broad categories:

- Fall prevention
- Fall protection

When feasible, fall prevention must be used in place of fall protection to minimize the risk to personnel from falling during work at height. In all other cases, fall protection must be used.

The hazard analysis shall identify the need for special processes such as gas testing. Gas testing will be performed in accordance with the OE Corporate Required Standard Portable Gas Detection.

The hazard analysis shall identify the need for Simultaneous Operations (SIMOPs), and if so, to evaluate potential hazards associated with the SIMOPs. SIMOPs activities will be performed in accordance with the JO Simultaneous Operations Standard.

5.3.1 Working Over Excavations

The requirements for fall prevention and protection are required by this standard when working at the edge of or over an excavation or pit. It is important to consider falls below grade as well as falls above grade.

5.3.2 Fall Prevention Requirements and Risks

Fall Prevention is any system designed to prevent a person from falling. Fall prevention typically involves the use of engineering controls, such as railings.

5.3.2.1 Scaffolds

Depending on the type of work, site conditions and workload, scaffolding may be freestanding, hanging, suspended, mobile or special. The scaffolding type must be carefully selected to suit the intended purpose.

The following requirements are applicable to erection, use and maintenance of scaffolding:

- A Permit to Work is required for erecting scaffolding.
- Scaffolding shall be erected, altered and dismantled only by competent persons or under the supervision of a competent person
- Scaffolding must use a tagging and inspection system, for example, the Scafftag® system.
- Warning signs and barriers for incomplete scaffolds must be displayed when erecting or dismantling scaffold, and scaffolding must be effectively isolated from entry.
- Scaffolding should not restrict access to or egress from work areas, escape routes or safety/emergency routes. Alternative measures must be implemented to avoid restricting access or egress.
- Scaffolding must be inspected at regular intervals of at least every 7 days by a competent person, or following any modification, or as soon as practicable if the scaffold has been subject to overloading, damage or extreme weather conditions.
- Scaffolds must be inspected daily and prior to use by those using the scaffolds.

- Scaffolds must be securely supported and able to hold required loading.
- Scaffolding must be installed with fully secured boarding to prevent the dropping of items between floorboards. Platform planks must be butted together and secured at both ends. Scaffolding must have properly secured ladder access.
- Working platforms must be of sufficient width to provide a clear passageway.
- Open sides and ends of working levels that are six feet (183 cm) or more above grade must be fitted with top rails, midrails, and toeboards with a top railing at 42 inches (107 cm) above the platform level.
- Suitable work area barricades are required during the construction of scaffolding.
- When possible, steel or aluminum scaffolding planks shall be used. When wooden planks are used, the requirements listed in section 12 of the Chevron Safety in Design Manual (3.80MB) shall be followed.
- Scaffolding must be used only for temporary work platforms.
- A register of scaffolds and records of inspection, maintenance, hazard analysis and competencies must be maintained.

Personal fall protection (harnesses and lanyards) must be worn by personnel who are exposed to falls. One hundred percent tie off is required. This requirement extends to:

- Personnel working on scaffolds that are not completely enclosed by guardrails and midrails.
- Workers erecting scaffolds and those who are working outside of handrails and at elevations of six feet (183 cm) or more above a working surface.

The platforms and scaffolds must meet the relevant minimum standards in section 12 of the Chevron Safety in Design Manual (3.80MB) or Bamboo Scaffolding (229KB) depending on service and type.

5.3.2.2 Risks Associated with Scaffolds

Risks associated with the use of scaffolds differ with the type of scaffolding. Common risks that shall be considered during the hazard analysis and while working at height include:

- Collapse of incorrectly constructed scaffolding.
- Falls during scaffold construction.
- Scaffolding that is inadequately braced or tied to the building or other supporting structure.
- Falls caused by missing scaffold planks, guardrails, midrails, and toe boards.
- Items dropped from the scaffold onto people or equipment below.
- Scaffold collapse caused by impact, for example, from a vehicle.
- Clearance between scaffolding equipment and power lines. (Note: Minimum clearances will be maintained in accordance with the OE Corporate Required Electrical Standard.)

5.3.2.3 Mobile Elevating Work Platforms (MEWPs)

MEWPs, also known as power-operated elevating work platforms, are designed to provide a temporary working platform which can be easily moved from one location to another. MEWPs height can be adjusted using articulation, scissor mechanisms, telescoping booms or towers. The platforms can be vehicle-mounted, self-propelled, towed or manually moved.

A competent person shall be designated to operate the work platform, scissor lift, cherry picker, crane lift platform, building maintenance unit or man lift.

A fall-arrest system (such as a fall-arrest harness and lanyard) shall be used in conjunction with a MEWP.

MEWPs shall be used, maintained and inspected in accordance with Power-Operated Elevating Work Platforms (261KB).

5.3.2.4 Risks Associated with MEWPs

Risks associated with the use of MEWPs that shall be considered during the hazard analysis and while working at height include:

- Clearance between MEWP equipment and power lines. (Note: Minimum clearances will be maintained in accordance with the OE Corporate Required Electrical Standard.)
- Collapse or overturning of the MEWP
- Personnel falling or being thrown from the carrier or basket
- Persons in the carrier or basket becoming trapped against fixed structures
- Persons in the carrier or basket contacting live electrical wires

Factors in a collapse or leading to overturning incidents typically include:

- Equipment failure
- Soft, unstable or uneven ground conditions
- Faulty outriggers, or outriggers not being used, or used incorrectly
- MEWP being struck by a vehicle or other mobile platform
- Overloading the carrier or basket
- Carrier or basket being struck by a load

Factors implicated when personnel fall or are thrown from the carrier or basket typically include:

- Sudden movement of the carrier or basket caused by an impact
- Ground movement
- Overreaching from the carrier or basket
- Climbing into or out of an elevated carrier or basket

5.3.2.5 Skylight Barricading and Guarding

When feasible, skylights that are flush with the roof surface shall be guarded by either of two methods:

- Installing permanent skylight metal screens over or under the skylight. The screen must be capable of withstanding a 120 kilogram (265 pound) load that is applied perpendicular to any point. The metal screen shall be of such construction and mounting that under ordinary loads or impacts, it will not deflect downward sufficiently to break the glass below.
- Installing fixed guardrails.

Otherwise, when work is to be performed on a roof where personnel would be exposed to the risk of falling through openings, the openings shall be covered with temporary wooden planking or metal plates before the work proceeds. The installation of the covering must be performed in a manner that protects the personnel installing the temporary planking from falling through or off of the roof.

5.3.2.6 Risks Associated With Skylights

Common risks associated with skylights that shall be considered during the hazard analysis and while working at heights include:

- Inadvertently falling through an unguarded skylight.
- Falling through an unguarded, non-visible (painted) skylight.

5.3.2.7 Openings in Decks/Floors

Personnel shall wear fall-arrest equipment when making an opening in the deck or floor. Openings in decks accessible to personnel shall be covered, guarded or otherwise made inaccessible. The manner of blockage shall prevent a person's foot or body from inadvertently passing through the opening.

Unintentional openings in decks accessible to personnel shall be covered, guarded or otherwise made inaccessible immediately and reported to the Work Team Leader.

5.3.2.8 Accessing Storage Tank Roofs

Access to above-ground storage tanks is considered work at height and shall be addressed in accordance with Accessing Tank Roofs.

5.3.3 Fall Protection Requirements and Risks

Fall-arrest systems are designed to support and hold a person in the event of a fall. They are not designed to support a person while working.

This standard **prohibits** the use of body belts for fall-arrest purposes.

Fall-arrest systems must always be used as a last resort. These systems require a high level of training to set up and to use. Fall-arrest systems shall be used only if personnel have been fully trained in their use, and emergency rescue procedures are in place.

5.3.3.1 Fall-Arrest Protection System Inspection

There shall be a system for ensuring that fall protection equipment is fit for use and that all of the following occur as needed or within the time frame specified:

- Equipment testing and certification for use is performed and documented by a competent person and occurs every two years, or more frequently where required by local regulations.
- Equipment is inspected by the user before use.
- Equipment is inspected, tested and recertified for use by a competent person after a fall has occurred.

- Equipment is repaired or destroyed when inspection has shown evidence of excessive wear or mechanical malfunction.

5.3.3.2 Anchor Point Selection

Selection of the type and location of anchorage points will depend on the nature and location of the task and the construction of the building or supporting structure. Anchorage points for fall-protection devices shall be, where practical, above the head of the worker. The anchorage point must ensure that, in the event of a fall, the path below will be free of obstacles or other hazards, and the worker will neither swing nor touch the ground.

5.3.3.3 Anchorage Point Testing

There must be a system for ensuring that anchorage points are tested in accordance with a recognized standard and/or approved by a competent person to ensure that the points are secure and can hold the required load. Anchorages used for attachment of personal fall-arrest equipment shall be independent of any anchorage being used to support or suspend platforms and capable of supporting at least 5,000 pounds or 22.2 kN (kilonewtons) per attached employee. Otherwise, the anchorage shall be designed, installed and used as part of a complete personal fall-arrest system (PFAS) that maintains a safety factor of at least two. The anchorage shall be under the supervision of a qualified person.

5.3.3.4 Never Work Alone Using a Fall Arrest Protection System

Workers wearing harness systems shall never work alone; someone must be available to begin the rescue process quickly if a fall should occur. A Safety Standby must be present to notify Rescue Personnel (who must be immediately available) to assist a fallen worker.

5.3.3.5 Requirement for 100 Percent Tie Off

Personnel working at height must always be connected (tied off) so that they are protected by their fall-arrest system or work-positioning system while ascending, descending, moving point to point, or conducting work activity.

5.3.3.6 Risks Associated with Fall-Arrest Systems

Risks associated with the use of fall-arrest systems that shall be considered during the hazard analysis and while working at heights include:

- Worker does not tie off
- Worker does not tie off correctly, and the structure is unable to take the load
- Worker does not tie off overhead and then swings into an object during a fall
- Worker is not wearing the harness correctly and slips through the harness
- Worker is hanging in a harness and suffers suspension trauma
- Worker does not calculate distance required to arrest fall correctly and hits ground or structure below

Refer to tool at Appendix C: Appendix C: Fall Distance Calculation Checklist Tool.

5.3.4 Ladders

Although ladders are not classified as fall prevention or fall protection devices, they are included here because they are commonly used for working at heights.

Defective, damaged or ladders deemed unsafe shall be tagged and removed from service.

5.3.4.1 Portable Ladders

For some jobs of short duration, such as those in which work is within easy reach and can be carried out with one hand, a portable ladder may be the only practical means of access. Working while on a portable ladder shall only be considered if there are no other practical means of performing the work.

Common types of ladders include step, single and extension ladders. They can be made of wood, aluminum and fiberglass. Portable ladders must meet the requirements of Portable Ladders and be used, maintained and inspected in accordance with this standard.

5.3.4.2 Risks Associated With Portable Ladders

Risks associated with the use of ladders that shall be considered during the hazard analysis and while working at height include:

- Overreaching and tipping the ladder.
- Not using three points of contact when ascending or descending, losing balance and falling, for example, when hand-carrying tools. (Tools should be raised and lowered using a hand line.)
- Unstable footing, causing the ladder to tip.
- The base of the ladder is either too close or too far from the building. (The correct angle for a ladder is one unit of measurement out at the base for every four units of height.)
- The ladder is damaged or inappropriate for the task.
- An extension ladder or folding ladder is not locked in position.
- Live electrical wires are in contact with the ladder.

5.3.4.3 Fixed Ladders

Fixed ladders must be installed in accordance with the Safety in Designs Manual (3.80MB). The risks associated with the use of fixed ladders that shall be considered during the hazard analysis and while working at height include:

- How a rescue will be managed, if required. Consider requiring personnel to wear harnesses when climbing and descending fixed ladders to facilitate rescue.

5.4 Emergency Rescue

Circumstances may arise when workers need to be rescued from work at height. An emergency rescue plan shall be in place prior to work commencing. It is important to select rescue services or teams, either onsite or offsite, that are adequately trained and equipped to perform work-at-height rescues of the kind needed at the facility and that can respond in a timely manner.

For personnel using fall-arrest systems, the items below must be considered. See Section 6 for an example of a Fall-Arrest Emergency Plan (6.44MB).

- Suspended workers shall be rescued as quickly as possible because they are at risk of suspension trauma. Suspension trauma is potentially life-threatening. Suspended workers with head injuries or who are unconscious are particularly at risk.

If an offsite rescue service is being considered, the service must be contacted and its ability to respond to specific emergencies must be assessed. Merely posting the service's phone number or planning to rely on an emergency phone number to obtain these services at the time of a work-at-height emergency does not comply with this standard.

Issues to consider when determining which rescue approach to take (either onsite or offsite) include:

1. Response time, that is, how quickly the rescue team or service can get from its location to the work site where rescue at height may be necessary. Relevant factors to consider include the following:
    a. The location of the rescue team or service relative to the work site.
    b. The quality of the roads and highways to be traveled.
    c. Potential bottlenecks or traffic congestion that might be encountered in transit.
    d. The reliability of the rescuer's vehicles.
    e. The training and skill of its drivers.
2. The availability of the rescue team or service and whether they are unavailable at certain times of the day or in certain situations. Consider whether key personnel from the rescue service might at times be unavailable.
3. For offsite services, ascertain whether the service is willing to perform rescues at the site where work at height is in progress. (JO cannot rely on a rescuer who declines, for whatever reason, to provide rescue services.)
4. Is an adequate method of communication between the work site and prospective rescuer available?
5. Can the prospective rescue team or service properly perform work-at-height rescues? Does the team or service have the technical knowledge and equipment to perform rope work or elevated rescue, if needed?
6. Does the rescue team or service have the necessary skills in medical evaluation, patient packaging and emergency response?

5.5 Work at Height Review Checklist

A checklist is provided in Appendix B: Work at Height Review Checklist to enable users to quickly perform a site analysis of any work-at-height setup. This checklist is a tool to assist in the analysis and cannot be used as a substitute for conducting a full hazard analysis as required in section 5.1 – Assessing and Managing Hazards.

6.0 Records

6.1 Required Records

The following records will be kept:

- Copies of permits and associated documentation (including register of scaffolds and records of inspection, maintenance, hazard analysis and competencies) shall be maintained in accordance with the JO Permit to Work SWP Standard.

6.2 Retention Requirements

Documentation shall be retained as required by local regulation, JO policy or for a minimum of six months, whichever is greater.

7.0 References

Following is a complete list of the documents referenced by this standard:

Table 1. Document List

Title	File Name
Accessing Tank Roofs, Chevron Research and Technology Company, December 1999, Loss Prevention Guide Number 6.	Accessing Tank Roofs (31.1KB)
PNCM2: Bamboo Scaffolding, Practice Notes for Construction Managers, Hong Kong Institute for Construction Managers, First Issue 2003.	Bamboo Scaffolding (229KB)
Portable Ladders, Chevron Research and Technology Company, August 1999, Loss Prevention Guide Number 2.	Portable Ladders (131KB)
Mobile Elevated Work Platforms and Man Lifts, New Zealand Department of Labour Approved Code of Practice for Power-Operated Elevating Work Platforms, May 1995.	Power Operated Elevating Work Platforms.pdf (261KB)
Fall Protection, Chevron Research and Technology Company, February 2000, Loss Prevention Guide Number 12.	Fall Protection (51KB)
Safety in Designs, Chevron Energy Technology Company Loss Prevention Unit, Revised February 2007.	Chevron Safety in Design Manual (3.80MB)
Global Marketing – Fall-Arrest Emergency Plan	Fall Arrest Emergency Plan.doc (6.44MB)
Joint Operations –Training Requirements Tool	JO_MSW_TrainingRequirementsTool.doc
Example Inspection Form – Beam Glyders™	BeamGlydersInspection.doc
Example Inspection Form – Full Body Harnesses	FullBodyHarnessInspection.doc
Example Inspection Form – Lifelines	LifelineInspection.doc
Example Inspection Form – Rescue Positioning Devices	RescuePositioningDevice.doc
Example Inspection Form – Rope Grabs	RopeGrabInspection.doc

Title	File Name
Example Inspection Form – Self-Locking Carabineers	SelfLockingCarabinersInspection.doc
Example Inspection Form – Short Lanyards	ShortLanyardInspection.doc
Example Inspection Form – Self-Retracting Lifelines	SRLInspection.doc
Example Inspection Form – SRL Sealed Units	SRLSealedUnitInspection.doc
Example Inspection Form – Synthetic Horizontal Lifelines	SyntheticHorizontalLifelineInspection.doc
Example Inspection Form – Tag Lines	TagLineInspection.doc
Example Inspection Form – Tie Off Adaptors	Tie-OffAdapters.doc

8.0 Other Guidance Documents

Table 2. Document List

Title	File/Link Name
Joint Operations – Confined Space Entry Standard	JO_MSW_ConfinedSpaceEntryStandard.doc
Joint Operations – Hot Work Standard	JO_MSW_HotWorkStandard.doc
Joint Operations – Isolation of Hazardous Energy Standard	JO_MSW_IsolationofHazardousEnergyStandard.doc
Joint Operations – Permit to Work Standard	JO_MSW_PermitToWorkStandard.doc
Joint Operations – Lifting and Rigging Standard	JO_MSW_LiftingAndRiggingStandard.doc

9.0 Document Control

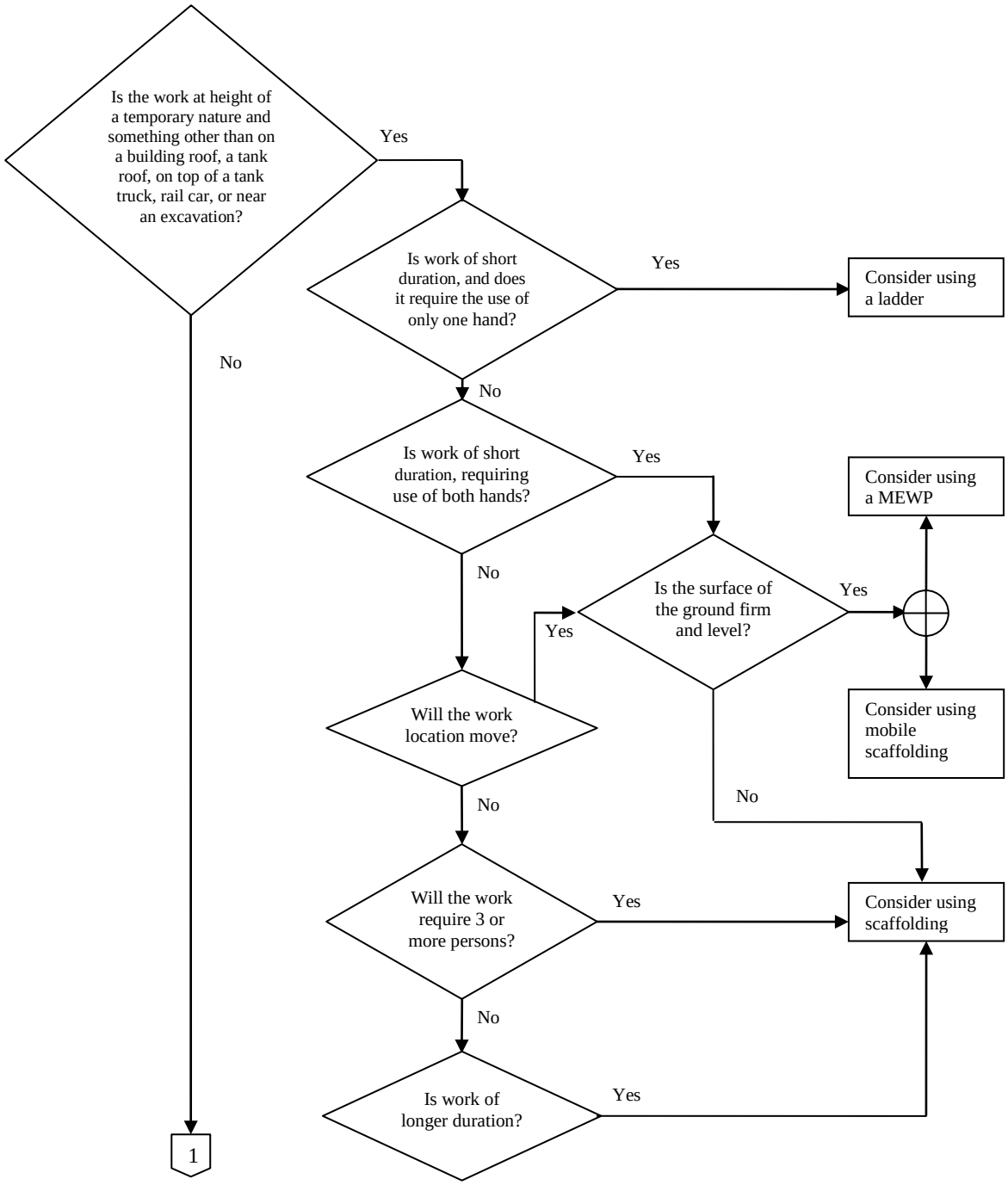
Table 1: Document Control Information

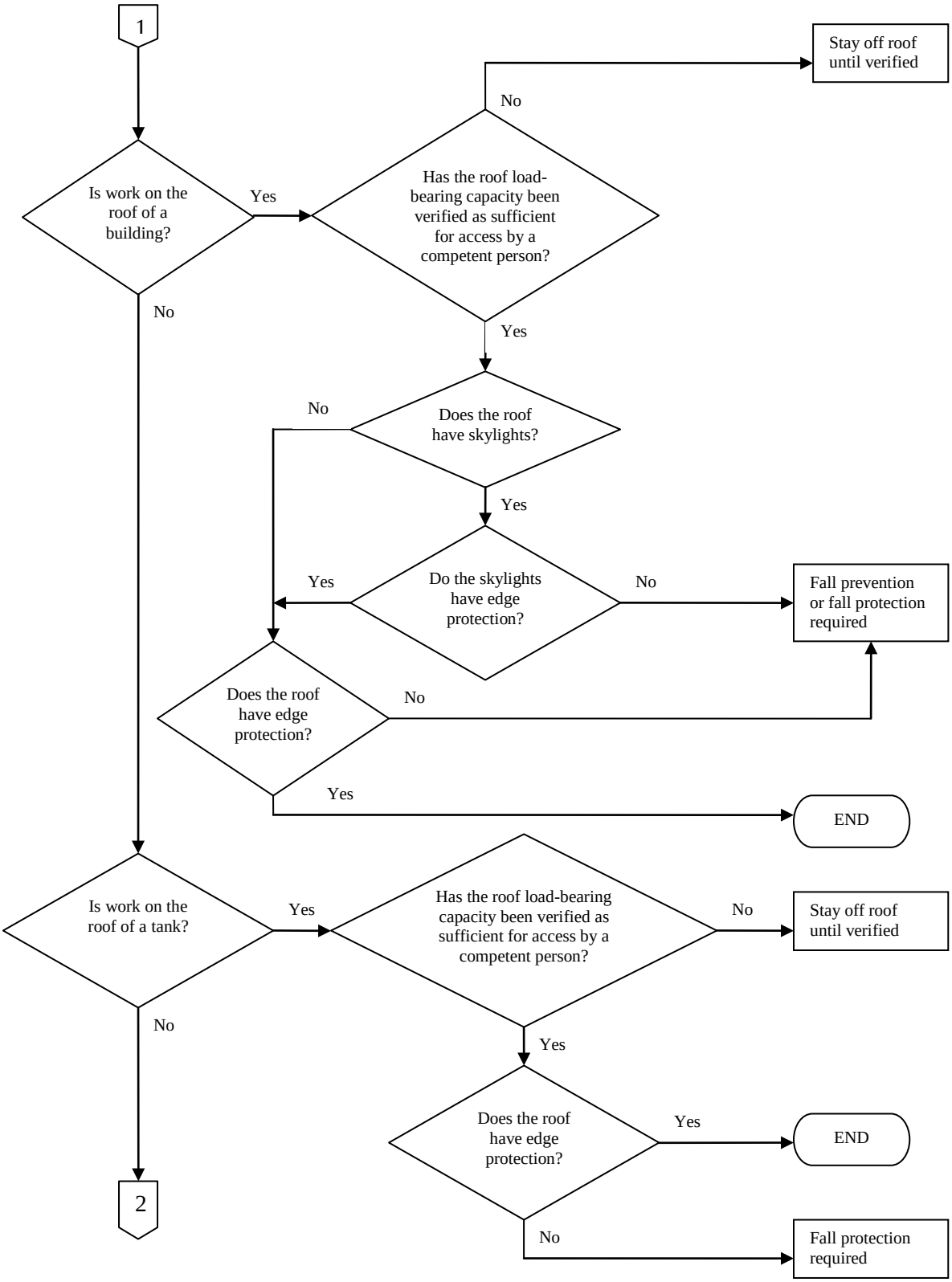
Description	GU Common	SBU-Specific
Approval Date	27 February 2008	*17 December 2009*
Unapproved Revision	27 February 2011	*17 December 2011*
Next Revision	2 April 2013	
Control Number		

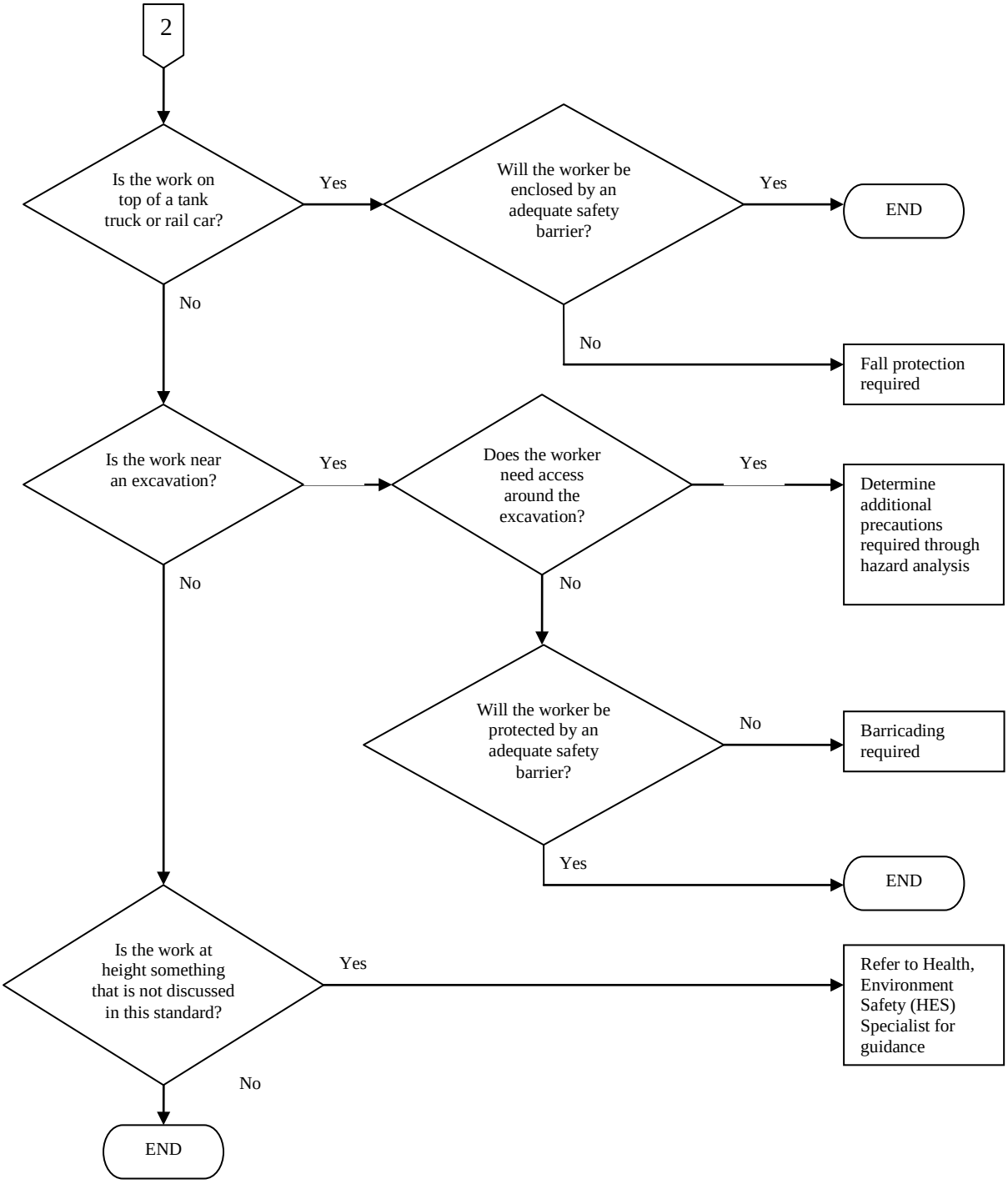
Table 2: Document History

Version Number	Date	Notes
1.0	27 February 2008	GU Adoption
1.1	8 December 2008	OE Mentor bookmarks
1.1.1	17 December 2008	SAC Adoption of MSW Process
1.1.1.A	26 March 2009	JO Version Created
1.1.1.B	20 July 2010	Added Rescue Plan
1.2	09 September 2009	Updated linked documents
1.3	02 April 2013	Updated document to include Corporate Required MSW Process requirements

Appendix A: Flowchart for Determining Work at Height Control Measures




1
Stay off roof until verified
No
Is work on the roof of a building?
Yes
Has the roof load-bearing capacity been verified as sufficient for access by a competent person?
No
Yes
No
Does the roof have skylights?
Yes
Yes
Do the skylights have edge protection?
No
Fall prevention or fall protection required
Does the roof have edge protection?
No
Yes
END
Is work on the roof of a tank?
Yes
Has the roof load-bearing capacity been verified as sufficient for access by a competent person?
No
Stay off roof until verified
No
Yes
Does the roof have edge protection?
Yes
END
No
Fall protection required
2


2
Is the work on top of a tank truck or rail car?
Yes
Will the worker be enclosed by an adequate safety barrier?
Yes
END
No
No
Fall protection required
Is the work near an excavation?
Yes
Does the worker need access around the excavation?
Yes
Determine additional precautions required through hazard analysis
No
No
Will the worker be protected by an adequate safety barrier?
No
Barricading required
Yes
END
Is the work at height something that is not discussed in this standard?
Yes
Refer to Health, Environment Safety (HES) Specialist for guidance
No
END

Appendix B: Work at Height Review Checklist Tool

This checklist is provided as a tool for users to quickly perform a site analysis for any work at height. This checklist is not to be used as a substitute for conducting a full hazard analysis. (See section 5.1 – Assessing and Managing Hazards.)

Planning

- ☐ Can the work be done at ground level instead of at height?
- ☐ Has a hazard analysis for work at height been completed?
- ☐ Are personnel trying to locate any overhead electrical cables?
- ☐ Are personnel keeping a safe clearance (distance away) from power cables? (Safe clearance from 230 kV is 13 feet (4 meters); safe clearance from 50kV is 10 feet (3 meters)
- ☐ Are personnel who will be working at height trained and competent?
- ☐ Is there at least one means of egress (preferably two) from an elevated level?
- ☐ Is the potential fall path free of obstacles or other hazards?
- ☐ Is there a rescue plan, and is rescue equipment in place?
- ☐ Has the structural integrity of roofs or other elevated work areas been verified?
- ☐ Has the risk to people below been eliminated?

Power-Operated Elevating Work Platforms

- ☐ Is it safe to operate powered machinery in the area?
- ☐ Has the work platform machinery been inspected and deemed fit-for-use?
- ☐ Is there a permit covering the use of the work platform?
- ☐ Is the ground at the work area stable and level?
- ☐ Is the work platform stable?
- ☐ Is the ground able to support the weight of the machine and its intended load?
- ☐ Is the work platform the correct type and fit for the intended work?
- ☐ Has the operator been trained to set up and operate the particular type of work platform?
- ☐ Is the work platform being operated within maximum load tolerance?
- ☐ Is the work area clear of obstacles and power lines?
- ☐ Do the workers remain inside the basket or platform when elevated to any height?
- ☐ Do the workers wear harnesses with lanyards attached to the work platform while in the basket or platform?

Scaffolds

- ☐ Are scaffolds equipped with safety tags identifying their current status and condition?
- ☐ Are workers staying within the confines of the approved scaffolding?
- ☐ Has access been maintained to critical equipment?
- ☐ Is the scaffold erected on a firm foundation?
- ☐ Are scaffold guardrails in position?
- ☐ Is the scaffold fully planked out with no gaps greater than three cm (one inch)?
- ☐ Have scaffolding planks been checked for evidence of physical damage such as saw cuts, and imperfections such as cracks or splits? Have defective planks been replaced?
- ☐ Is fixed-ladder access between platforms provided?
- ☐ Are workers using tool bags or belts to allow both hands to be free when climbing?
- ☐ Where required, have harnesses been provided?
- ☐ Is a certified scaffolder in direct charge of erection, modification or dismantling of any scaffold more than five meters (16 feet) above the ground?
- ☐ Are the scaffolding planks in storage kept off the ground and in a dry condition?
- ☐ Has the scaffolding been removed after work is complete?

Portable Ladders

- ☐ Is the ladder appropriate for the task?
- ☐ Is the ladder used only on a stable and level surface?
- ☐ Is the ladder stable, on secure footing and tied off to prevent sliding, or is someone helping by holding the ladder?
- ☐ Is the area around the top and bottom of the ladder clear of obstacles?
- ☐ Do ladders used to gain access to a roof or other areas extend at least three rungs or one meter (three feet) above the point of exit?
- ☐ Are workers facing the ladder as they climb?
- ☐ Are workers using three points of contact at all times when climbing or descending ladders?
- ☐ Are workers using tool bags or belts to allow both hands to be free when climbing?
- ☐ If ladders are being used in areas where other activities or traffic may interfere, are the areas surrounding the ladders barricaded?
- ☐ Are non-conductive ladders being used near energized electrical equipment?
- ☐ Are ladders periodically being inspected according to local requirements?
- ☐ Are defective ladders removed from service and tagged out as unserviceable with a “Do Not Use” sign?
- ☐ Are the locking mechanisms in the locked position on folding ladders?

☐ Is the angle of any free-standing ladder following the 4:1 rule? That is, for every four units of measurement in height, the base of the ladder is one unit of measurement out from the object on which it is resting.

Personal Fall-Arrest Systems (PFAS)

☐ Are workers using harnesses?

☐ Have the harnesses been inspected and deemed fit for use?

☐ Are the harnesses being worn correctly?

☐ Are lanyards being anchored at waist height or higher?

☐ Is the anchorage adequate for the load?

☐ Is the fall-arrest line shorter than the possible fall distance?

☐ Is there a rescue plan, and is rescue equipment in place?

☐ Are workers using PFAS being supervised or monitored?

☐ Are workers complying with the 100 percent tie off requirement?

Appendix C: Work at Height Rescue Plan

Chevron	WORK AT HEIGHT RESCUE PLAN	General Work Permit Number		Rescue Plan Created By?
		Date		

1. TASK DETAIL			
Job/Task Description			
Division		Worksite Location	
Permit Approver		Work Team Leader	

2. EQUIPMENT (List of Equipment available)		
Do rescue personnel require fall protection equipment to perform the rescue?	Yes	No
List all equipment available at job site:		
Selected Rescue System:		
Is rescue system length sufficient to complete the rescue?	Yes	No
Has suitable rescue system anchor point(s) been selected?	Yes	No
List Rigging Equipment required to perform the rescue:		
Are there any specific risks from the work at height?		

3. EMERGENCY CONTACT				
Emergency Contact Number		Emergency Services Notified of Work Before Start	Yes	No

4. METHOD STATEMENT (Include sketch of rescue equipment setup, if applicable)	
Step	Action

Possible Worst Case Scenario	
Rescue Plan	
Other Scenarios to consider	

Work at Height Rescue Plan – Sketch of Rescue Operation

Appendix D: Fall Distance Calculation Checklist Tool

Required Ground Clearance Calculation (from where your lanyard snap hook attaches to the anchor point) *** You must be familiar with your equipment!**

Example:

Lanyard Length	(6 ft or 1.8 m)
+ Shock Absorber deployment	(4 ft or 1.2 m)
+ D-Ring movement	(1 ft or 0.3 m)
+ Average body height (heels to D-Ring =	5 ft or 1.5 m)
+ Safety distance	(1 ft or .3m)
= Total Fall Distance =	**17 feet or 5.1 meters**

Your Calculation:

Lanyard Length		_____
Shock Absorber deployment	+	(4 ft or 1.2 m)
D-Ring movement	+	(1 ft or 0.3 m)
Body height (heels to D-Ring)	+	_____
Safety distance	+	(1 ft or .3m)

Total Fall Distance = _____

Height of Anchor Point _____
Minus -

Fall Distance Calculation _____
Equals =
Ground Clearance _____

Anchor Point will hold 5000 lbs (22.2 kilonewtons)?

Identify Anchor Point _____