New Zealand DEFENCE FORCE
Te Ope Kātua O Aotearoa

C.H.E.S.S.

DEI CONSTRUCTION HEALTH ENVIRONMENT & SAFETY SPECIFICATIONS

DEI Job Safety Analysis Procedure Guide

November 2020
V1.2

A FORCE FOR NEW ZEALAND

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For the purposes of continual improvement, this document will be reviewed at least every 12 months from the last publish date.

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If any of the content of this document is no longer current, contact DEI Health & Safety Coordinator via email at ***DEIH&S@nzdf.mil.nz*** to make updates.

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New Zealand DEFENCE FORCE
Te Ope Kātua O Aotearoa

Chief of Defence Force
SAFETY POLICY STATEMENT

OUR SAFETY VISION:

Everyone in the NZDF is responsible for safety in everything we do.

AM Kevin Short
Chief of Defence Force
25 JULY 2019

MY COMMITMENT:

The New Zealand Defence Force is a military organisation. Our core purpose is the preparation and availability of credible and effective armed forces, capable of meeting the Government's defence and national security objectives.

This can mean responding to tough situations, in challenging environments, both in New Zealand and abroad. Given these realities, sometimes our people will be placed into situations where there will be risks that cannot be avoided.

Nonetheless, I am committed to taking every reasonably practicable step to keep our people and the public safe. I am committed to pursuing excellence in the way we manage safety through our systems, controls, procedures, consultation and participation.

I require appropriate safety risk management measures to be in place wherever we are based, work, train and operate. Together we are to be committed to continuous improvement of our safety system.

A FORCE FOR NEW ZEALAND

OUR COLLECTIVE COMMITMENT:

"Our Values should guide everyone in the NZDF to be responsible for safety in everything we do."

As a professional Force, I require everyone within the NZDF to demonstrate:

- **Tū Kaha** | Courage to speak up when we see things that are wrong, before they cause harm;
- **Tū Tika** | Commitment to working in a safe way;
- **Tū Tira** | Comradeship by looking out for one another; and
- **Tū Maia** | Integrity by doing the right thing – always! Even when no one is watching.

WE WILL:

- Take every reasonably practicable step to keep ourselves and others safe from harm;
- Follow all safety Orders, Instructions and good safety practices;
- Understand the risks we face and actively manage these in a timely and effective manner;
- Encourage safe work practices through active participation in safety risk management;
- Uphold a culture where everyone can and has the right to, speak up about safety concerns;
- Report and record accurately safety events and concerns;
- Demonstrate proactive safety leadership that models NZDF values; and
- Regularly monitor and assess our safety performance, always striving for improvement.

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GLOSSARY

Term/Abbreviation	Definition/Description
ALARP	**A**s **L**ow **A**s **R**easonably **P**racticable – the term used to indicate the level of risk is acceptable given cost and difficulty considerations.
Confined Space	Defined as any activity occurring wholly or partly in a confined workspace as defined in AS 2865:1995 Safe Working in a Confined Space.
Consequence	A consequence is the result of a top event. The possibility or severity of a consequence may be mitigated by controls.
Control	Controls are designs, systems, methods or procedures used to minimise or eliminate the risk of injury or damage from hazards.
DEI	**D**efence **E**state & **I**nfrastructure – NZDF Branch responsible for creating, maintaining and upgrading NZDF properties, bases and infrastructure.
EDM	**E**state **D**elivery **M**anager - DEI staff member in charge of the maintenance or construction performed at one or more Defence estates
ERP	**E**mergency **R**esponse **P**lan - An ERP is a detailed plan that is executed in the event of an emergency. It includes processes and procedures relating to emergencies such as fire and earthquake, evacuation processes, and meeting points. Some tasks may require amendments to the site/base ERP.
Hazard	A ***hazard*** is anything that is a potential source of harm or damage to people, plant, equipment or environment.
High Pressure	Hazards involving pressures higher than normal atmospheric pressure. This includes pressurised gasses, cryogenic liquids and pressurised liquids.
Hot work	Defined as any work where the temperatures generated are likely to ignite surrounding materials, e.g. cutting and welding, metal grinding, blow lamps and other equipment producing sparks, heat or a naked flame
issue	To issue a PTW means to approve or authorise it.
JSA	**J**ob **S**afety **A**nalysis - Job Safety Analysis is a procedure which helps integrate accepted safety and health principles and practices into a particular task or job operation. In a Job Safety Analysis, each basic step of the job is listed to identify potential hazards and to recommend the safest way to do the job. Also referred to as a Job Hazard Analysis (JHA) or a Task Analysis (TA).
NZDF	**N**ew **Z**ealand **D**efence **F**orce
Penetrating ground or structural works	a. Defined as any work requiring ground or structural penetration of any depth, with any device, for the purpose of: • Altering a structure; • Fixing a structure or object in place; • Testing ground stability for foundations; • Stabilise slopes; • Recovering a resource e.g. water, or • Disposing of any substance.
Permit to Work	A *Permit to Work* system is a written permission designed to manage potentially hazardous work and reduce the opportunity for human error. The system

Term/Abbreviation	Definition/Description
	constitutes a clear and standardised approach to identifying tasks, risk assessments, permitted task duration, supplemental or simultaneous activity and control measures. DEI requires a Permit to Work to be issued and displayed for any hazardous tasks on defence estate.
permittable tasks/work	In this document, any work requiring a *Permit to Work* is defined by the DEI Permit to Work Process, as '*permittable work*'.
Pipe works	Defined as any activity connected to the installation, maintenance, or repair of pipes and pipelines, fittings, plant or equipment relating to reticulated water, petroleum products, or other liquids or gases (not natural gas, CNG or LPG).
PPE	**P**ersonal **P**rotective **E**quipment – Equipment, clothing and protective gear used to protect and shield individuals from hazards.
PtD	**P**revention **t**hrough **D**esign. The process of designing a system in such a way that risks are removed or reduced to minimal levels without human intervention.
PTW Register	The PTW register should be used to record the number and details of each permit to work issued on site. This may be a spreadsheet or software controlled system.
Residual Risk	The probability and severity of a consequence, after safety controls have been put in place.
Risk	The likelihood of an incident or event occurring and the extent of injuries it causes.
SWMS	**S**afe **W**ork **M**ethod **S**tatement – a detailed step by step breakdown of a task from a safety perspective. A SWMS normally follows a Job Hazard Analysis (JHA) in describing how a task will be performed. This JSA procedure merges a JHA and SWMS.
Threat	A threat is a trigger (or cause) of a top event. It may be possible to use controls to minimise the possibility of a threat.
TMP	**T**raffic **M**anagement **P**lan – A TMP is a detailed plan to manage traffic around or through a work site. It may include the installation of barriers, lights or flagmen (traffic controllers).
top event	The event describing a loss of control. Hazards may cause a top event to occur, resulting in consequences.

1 Job Safety Analyses

1.1 About This Guide

WHAT THIS GUIDE IS FOR?

This guide provides a descriptions and a step-by-step procedure to perform a Job Safety Analysis in preparation for a Permit to Work application, for tasks carried out on New Zealand Defence Force (NZDF) estate.

WHO THIS GUIDE IS FOR?

This guide is for Contractors and NZDF staff needing to analyse and determine risk assessments and controls for construction and maintenance tasks.

WHAT IF I FIND A MISTAKE IN THE GUIDE OR HAVE A SUGGESTION?

If you find a mistake in this guide, please contact the DEI Health & Safety Coordinator at *DEIH&S@nzdf.mil.nz*.

2 Terms and Abbreviations

Table 1. Abbreviations and Definitions

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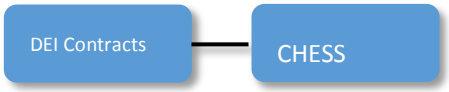
3 DEI Processes and Policies



3.1 CHESS Sub-processes and Procedures

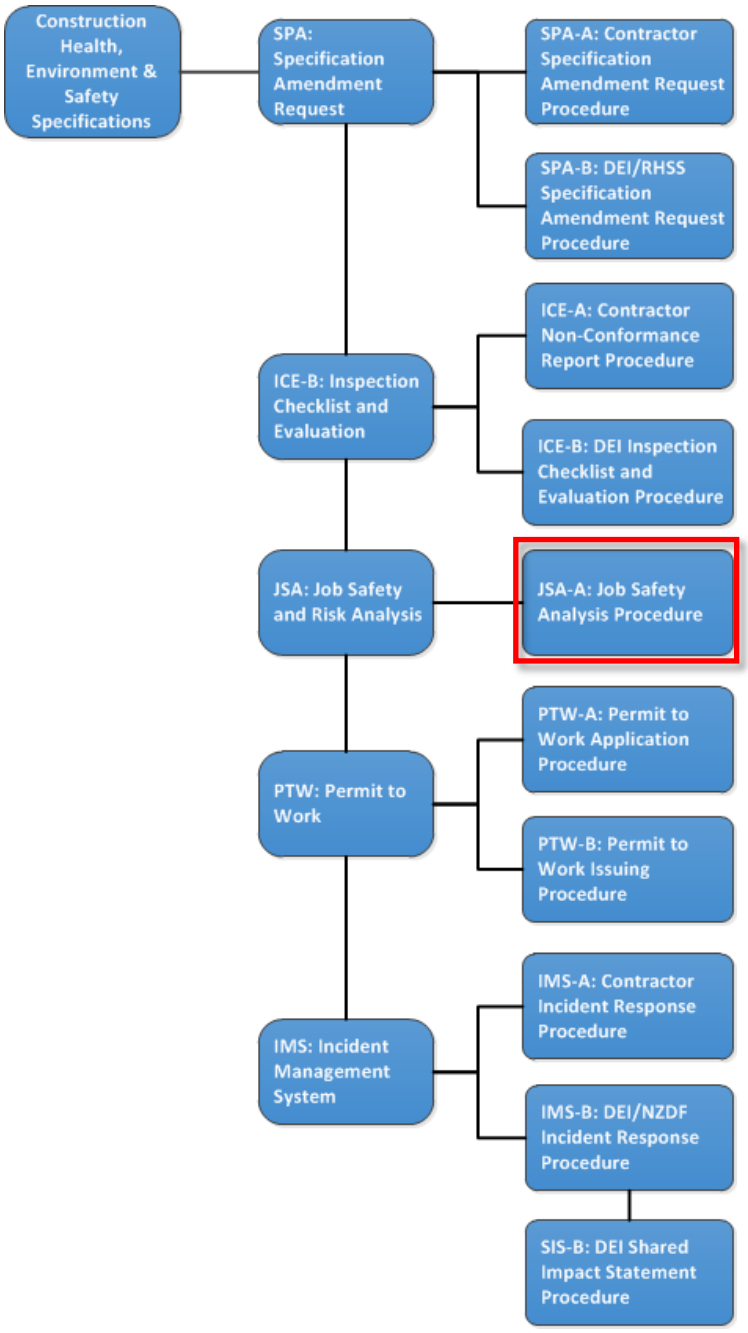


Figure 1. *CHESS Procedures and Sub-Procedures*

3.2 Related Procedures

PTW-A: Permit to Work Application Procedure. - Assists applicants in providing NZDF with enough information to allow them to check for hazards, and schedule permits around potential conflicts with other activities on the estate.

***PTW-B Permit to Work - Issuing Procedure*. -** Assists authorised Issuers to review, schedule and issue a *Permit to Work* on NZDF estate.

4 General Overview

Under the *Health and Safety at Work Act 2015*, risk assessment of individual hazards is essential for effective hazard management. Understanding and performing risk assessment and implementing appropriate control measures to mitigate risk, is vital to both protecting workers and business.

A Job Safety Analysis (JSA) is a procedure which helps integrate accepted health and safety principles and practices into a specific task or job. In a JSA, a task is broken down into its basic steps, and potential hazards and their risks are identified for each step.

4.1 When is JSA Required?

On all NZDF estate, a JSA is required for all activities described in the DEI Permit To Work Process. (see also **Notifiable, Restricted And Permittable Work**)

This includes:

- All notifiable works as defined in the *Health and Safety in Employment Regulations* 1995
- All restricted works as specified in the *Health and Safety in Employment (Asbestos) Regulations 1998*

A JSA is also required for any tasks that are not part of a current Standard Operating Procedure (SOP) and have a "Medium", "High" or "Extreme" risk assessment prior to implementing controls (according to the DEI Construction Hazard Risk Matrix).

In addition to supplying information for a *Permit to Work* application, a JSA can be useful in:

- Correcting unsafe conditions and processes;
- Training; and
- Accident investigation.

A properly completed JSA can be used when conducting a toolbox talk prior to commencing the task, ensuring:

- All members of the work team are aware of the risks and control measures required to perform the task safely;
- Roles and responsibilities for implementing controls are assigned and understood;
- The scope of the task has not changed; and
- No additional hazards have been introduced.

5 Creating a JSA

The four basic steps of a JSA are:

1. Select the task to be analysed
2. Break the task into a sequence of steps
3. Identify the potential hazards of each step
4. Identify the risk levels for each step
5. Determine controls to mitigate the hazards and risks.

It is common practise to create and use a JSA as a basis for a Safe Work Method Statement (SWMS). The DEI Job Safety Analysis procedure and associated form combines the two processes into one concise document.

5.1 Select the Task to be Analysed

Contractors or Site Supervisors must complete a JSA for any permittable task (a task that requires a *Permit to Work*) before it is undertaken on DEI estate, to ensure safety and proper implementation of safety controls. The scope of defined tasks should not be too broad (such as "build a house") or too small (such as "turn on a light switch"). Typically, tasks will be of a scope that would be the responsibility of an individual or small team to undertake in the course of a single shift.

It is good practice to perform a JSA on all tasks being undertaken. This will help ensure Supervisors do not miss hazards, or opportunities to lower the risks to workers performing tasks.

Where work is determined to have a low risk, unwritten or verbal hazard analysis processes may be used in the form of job-site discussions or personal hazard analysis. Individual Contractors and employer groups will have implemented their own Personal Hazard Assessment processes, such as "Take 5".

5.2 Breaking the Task into a Sequence of Steps

Supervisors often create a JSA for repetitive tasks by observing a worker performing the task, and recording each step and potential hazards as they go.

When creating a JSA, the entire team tasked with performing the task should be involved and consulted. This provides a larger pool of experience and helps promote acceptance of the resulting work procedure.

Breaking the task into a sequence of steps assists in identifying individual hazards as the potential source of harm to people or the environment. While some steps may not involve any hazards, others may involve more than one.

Describe each step as an action, not how to perform the step. For example, describe the step as "Weld hinge to the door" rather than "Switch the welder on and create an even weld 3 cm long to secure the hinge to the door".

5.3 Identify the Potential Hazards

The *Health and Safety at Work Act 2015*, requires risks to health and safety to be eliminated, or at least minimised as far as is reasonably practicable.

Risks to health and safety arise from people being exposed to anything that I the source of harm (i.e. hazards) and can be broken down into two components;

1. How likely it is harm will occur; and
2. The degree of consequences or harm if an incident occurs.

Before performing a risk assessment, it is essential to understand the difference between a 'hazard' and 'risk'.

- *A **hazard** is the potential source of harm, while*
- *A **risk** is the likelihood and severity of that harm occurring.*

*For instance, an uneven surface is a **hazard** as someone may trip on it, lose balance and fall. The likelihood and extent of injuries caused by the fall is the **risk**.*

Consideration should also be given to hazards to flora and plant, as well as personal hazards.

In addition, it is important to know and identify a number of other terms used when assessing hazards and analysing risks.

Table 2. Hazard and Risk Assessment Terms.

Term	Description
top event	A top event is the event describing a loss of control. Individual hazards may be the source of multiple top events. For example, when working at height, gravity (a hazard) may be the source of a number of top events, including: • Loss of balance; or • Dropped tools.
threat	A threat is a condition or action that may directly result in a top event. For example, a top event may be "dropping tools". Some threats that could cause this event are: • Wet tools (allowing tools to slip from grasp) • Slippery gloves (allowing tools to slip from grasp) • Tired hands (from holding or using tools for long periods, causing the hand muscles to tire)
consequence	The consequences of dropping tools may be: • Injury to people below, hit by the tool; or • Damage to structure or equipment.
controls	Controls are put in place to eliminate or minimise the probability of a threat occurring, or the severity of a consequence.
residual risk	The assessed risk after controls have been implemented

5.4 Identify the Risk Levels for Each Step

There are six basic steps to performing a risk assessment.

1. *Identify the hazards.*
2. *Identify the associated top events.*
3. *Identify the threats and consequences.*
4. *Assess the risk of threats and consequences.*
5. *Decide on control measures.*
6. *Determine residual risk.*

Step 1: Identify the hazards

Many tasks will involve one or more potential hazards. Walk around the workplace and examine environmental factors, physical conditions or actions and behaviours that may react in an unplanned manner, and could seriously harm the health or safety of workers and public while performing the task.

Most high risk sources of harm can be grouped into 14 broadly based hazard categories. The ***Hazard Category Reference Table*** lists examples of hazards in each category.

Remember that a hazard is a potential source of harm, not the event that occurs when control is lost, or the consequence of the event.

Step 2: Identify the top event

A top event is the event that occurs when there is a loss of control over the hazard. Individual hazards may be the source of multiple top events. Examine the hazards present in each step and determine what top events may occur when control is lost.

Events can happen immediately (like a fall), or can occur slowly over a long period of time (like asbestosis). Engage experienced workers in conversations about their work environment, as they are best placed to advise on the hazards existing in their workplace. Top events could include:

- Loss of balance
- Dropped tools
- Ignition

Step 3: Identify the threats and consequences.

Examine the identified top events to determine and list the threats that may cause them to happen. Multiple threats may be the cause of a top event. For example, threats to a "loss of balance" event may include:

- Tripping on an uneven surface
- Over-extending reach from a platform

Examine and list the possible consequences of an event occurring. These might include:

- Injury from a surface fall
- Injury or death from a fall from height.

Step 4: Assess the risk

After identifying threats and consequences, decide on the probability of them occurring.

Using the DEI Construction Hazard Risk Matrix*,* calculate the level of risk that is inherent in each item. It is this rating that will indicate the actions that are required to be taken, and when monetary costs could be considered.

*(The **Error! Reference source not found.** describes the 4 levels of risk used by DEI.)*

Step 5: Decide on control measures

After identifying the threats and consequences, and assessing their risk, review control options that can be used to mitigate the risk. Focus on managing the hazards with the most significant risks first before managing less serious risks. *Risks can either be:*

- *Eliminated completely; or*
- *Substituted for a lower risk work method, machine or product; or*
- *Minimised by either Isolation, Engineering Controls, Administrative Controls, PPE, or a mixture of these so that the likelihood of harm is reduced to an acceptable level (see **Hazard Control Hierarchy**).*

Elimination or substitution should always be the preferred methods of mitigating risks.

For example, controls for the threats and consequences may be:

- *Wet tools – use tool lanyards; provide towels to dry tools; provide covered work areas;*
- *Slippery gloves – provide non-slip gloves;*
- *Tired hands – require five minute breaks every 30 minutes to avoid muscle fatigue;*
- *Injury to people below hit by tools – provide safety nets below workers;*
- *Damage to structure or equipment – remove vital equipment below workers*
- Over-extending reach from a platform – provide fixed barriers to stop over-reaching
- Injury or death from a fall from height – provide solid barriers to prevent falls from platforms.

It is also best practice to involve an appropriate manager, H&S Representative and/or a group of workers who may be exposed to the identified hazard, in the risk assessment process. This ensures an appropriate level of experience is utilised in agreeing on the best controls to mitigate specific risks.

Step 6: Determine Residual Risk

After implementing the risk mitigation controls, re-assess each item, and calculate its new risk level using the DEI Construction Hazard Risk Matrix. The aim of control measures is to lower the risk level to Low wherever possible.

No work is to commence if the residual risk is Critical. Tasks with a residual risk of *Medium or higher* must be approved by the Site Supervisor, while tasks with a residual risk of *High*, must also be approved by the Site Manager before commencing.

5.5 *JSA Reviews*

All new tasks must undergo a JSA to determine any risk mitigation that may be required, and their residual risk. Should the task become a regular activity, and risks are ***Low****, it is recommended a Standard Operating Procedure (SOP) be developed to ensure consistency in the safe execution or the task.*

Record and implement the assessment process and agreed controls on-site.

As few workplaces are constant or static, a JSA is to be reviewed:

- *Every seven days; or*
- *When a change in the work acidity occurs; or*
- *When a new hazard is identified; or*
- *When work is stopped under a Stop Work Authority.*

The higher the risk rating, the more frequent reviews should be undertaken. Always record when a review was undertaken, who was involved, and have all participants sign the reviewed JSA.

5.6 *JSA Recording and Management*

Each JSA will have a document reference number assigned to it by the creator. JSAs are to kept onsite in a weatherproof environment with any supporting documentation. If a Permit to Work (PTW) is required, a copy of the JSA is to be attached to the Permit to work. When tasks are complete, the JSA and PTW (if applicable) should be archived for future reference.

Should a JSA become illegible at any time, a new JSA should be written and allocated a new reference number.

5.7 Training

Staff participating in the development of a JSA must have completed the DEI induction training prior to participating in any activity covered by the JSA.

6 Hazard Control Hierarchy

Implementing controls to mitigate the risks of hazards in the workplace, is the fundamental method of protecting workers. Worksite planners and supervisors use a hierarchy of controls as a means of deciding how to implement feasible and effective control solutions.

The diagram below represents a traditional hierarchy of controls.

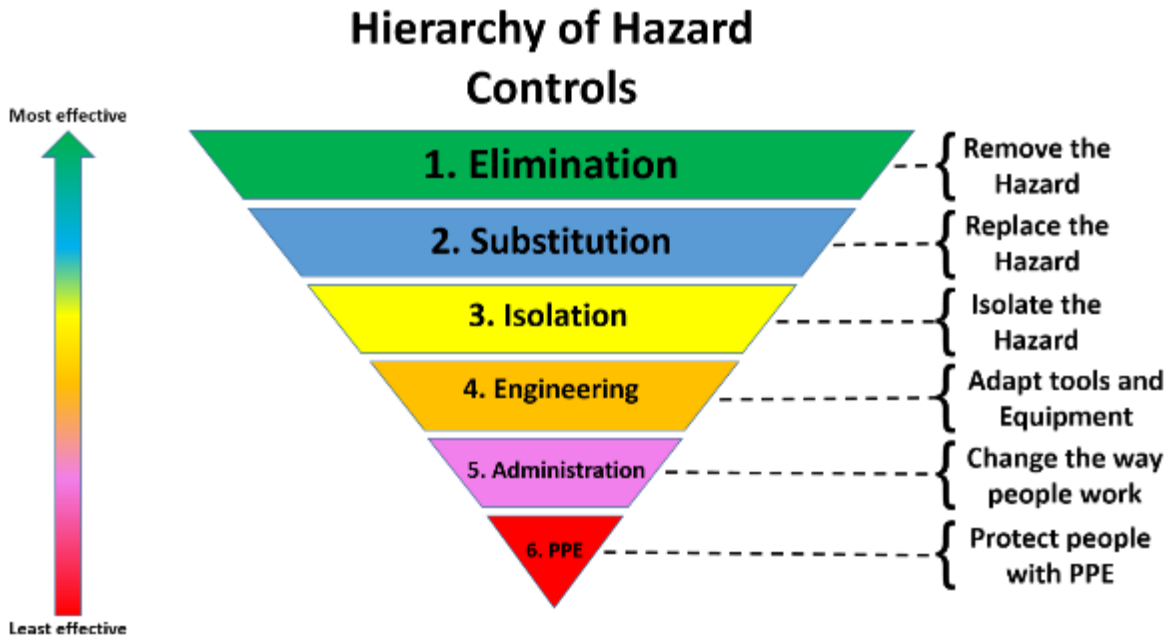


Figure 2. Hierarchy of Controls Pyramid.

This hierarchy identifies control methods at the top of an inverted pyramid which are potentially more effective and protective than those at the bottom. Implementing the top controls first will normally reduce the risks that are present in a task, and lead to inherently safer systems

6.1 Elimination and Substitution

Although the most effective, often elimination and substitution are the most difficult controls to implement in an existing process, as they may require expensive and difficult changes in equipment and procedures. For new processes and ones in the development stage, elimination and substitution of hazards may be more viable methods of mitigating the risks to workers, as they can be built into a system.

6.2 Isolation and Engineering Controls

Isolation (barriers etc.) and engineering controls should be used over administrative processes and personal protective equipment (PPE), as they remove (or lower) the human error factor present in many incidents. By removing (or mitigating) the hazard at the source, the worker is no longer exposed or has contact with the hazards in the workplace. Well-designed engineering controls may be costly in some instances, but can be highly effective in protecting workers, and are usually offset by the lower requirement for PPE and more importantly, reduced numbers of incidents. In some cases, lower operating costs can provide cost savings over the long term.

Removing or minimising interactions between the worker and the hazard provides a much higher level of protection and safety than changes to procedures or additional PPE.

6.3 Administrative Controls and PPE

Administrative controls and PPE have proven to be less effective than other control measures, requiring significant effort by the affected workers. However, they are often inexpensive to establish and are frequently used with existing processes, where hazards are not particularly well controlled.

7 Prevention through Design (PtD)

Prevention through Design (PtD) (also referred to as Safety in Design) is an initiative to prevent and reduce occupational injuries, illnesses, and fatalities by removing as many hazards as possible during the design phase of an operation or project.

By implementing level 1 (Elimination), 2 (Substitution), and 3 (Engineering) controls in all designs that impact workers, hazards are eliminated and risks are controlled to an acceptable level at the source of the hazard.

PtD is highly encouraged when creating or reviewing a JSA for tasks on NZDF estates.

7.1 Choosing Controls

Effective controls:

- Protect workers from workplace hazards;
- Help avoid injuries, illnesses, and incidents;
- Minimize or eliminate safety and health risks; and
- Help employers provide workers with safe and healthy working conditions.

The removal or avoidance of a hazard is always preferable to the implementation of controls that rely on human memory or compliance to mitigate risks.

To effectively control and prevent hazards, you should:

- Involve workers, who often have the best understanding of the conditions that create hazards and insights into how to control them;
- Identify and evaluate options for controlling hazards, using a "hierarchy of controls";
- Use a hazard control plan to guide the selection and implementation of controls, and implement controls according to the plan;
- Develop plans with measures to protect workers during emergencies and non-routine activities;
- Evaluate the effectiveness of existing controls to determine whether they continue to provide protection, or whether different controls may be more effective; and
- Review new technologies for their potential to be more protective, more reliable, or less costly.

Always implement the highest possible level of control (where 1 is high and 6 is low) for the best safety and protection of workers and the public.

8 Roles and Responsibilities

Resources assigned to the roles listed in this section may differ, depending on the structure of the associated departments. It is expected the Contractor will identify the roles and accountability within their Construction Safety Management Plan.

8.1 Contractor/Task Supervisor

The **Contractor** is responsible for:

- Performing and completing a Job Safety Analysis (JSA) for tasks not part of a current Standard Operating Procedure (SOP) and have an initial risk level of Medium or above;
- Ensuring workers and experienced personnel are consulted in the development and review of JSAs;
- Ensuring all identified controls are in place;
- Consulting with *appropriate managers, H&S Representative and/or a groups of workers to determine the most appropriate controls to be implemented.*

The **Site Manager** is responsible for:

- Ensuring a Job Safety Analysis (JSA) has been completed for tasks not part of a current Standard Operating Procedure (SOP) and have an initial risk level of Medium or above;
- Reviewing and authorising any tasks that have a residual risk level of High;
- Ensuring the residual risk is minimised to ALARP;
- Reporting incidents and near misses;
- Required and appropriate PPE is available to all workers.

The **Site Supervisor** is responsible for:

- Ensuring a Job Safety Analysis (JSA) has been completed for tasks not part of a current Standard Operating Procedure (SOP) and have an initial risk level of Medium or above;
- Ensuring the residual risk is minimised to ALARP;
- Reviewing and Authorising any tasks that have a residual risk level of Medium;
- Auditing and monitoring compliance with the JSA.

The **Task Supervisor** is responsible for:

- Ensuring a Job Safety Analysis (JSA) has been completed for tasks not part of a current Standard Operating Procedure (SOP) and have an initial risk level of Medium or above;
- Ensuring workers and experienced personnel are consulted in the development and review of JSAs;
- Ensuring all identified controls are in place;
- Approve new and revised JSAs;
- Ensure all workers performing the task are informed of the hazards, risks, and controls to be used for tasks;
- Ensuring workers are qualified, competent, and sufficiently trained to perform their assigned roles.
- Verifying all workers are using and implementing required PPE and controls;

Workers are responsible for:

- Ensuring they are aware of the hazards, risks, and controls to be used for a task;
- Ensuring all identified controls and PPE are in place and used;
- Ensuring they are capable of performing their assigned roles.
- Notifying Task and Site Supervisors when new hazards are identified;
- Signing the JSA to signify they have read and been involved in the creation of the JSA.

9 Hazard Category Reference Table

Table 3. Hazard Category Reference Table - pg.1

Biological	Biomechanical	Chemical	Ecological	Electrical	Gravity	Mechanical
• Airborne fibres/ particulates e.g. Asbestos • Bacteria • Blood Bourne Pathogens • Contaminated Soil • Contaminated Water • Fungi/ mould • Hygiene concerns • Insect/ Animal bites or stings • Vapours/ Dust/ Fumes/ Exhausts • Viruses • Water immersion	• Body position, uncomfortable position • Eye strain • Muscular overexertion/ manual handling • Repetitive operations • Working Posture	• Chemical transfer activities • Contamination dust, chemicals, sediment, effluent non segregated waste • Corrosives • Depleted oxygen • Explosives • Flammable vapours/ materials • Gasses (Oxygen, Carbon Monoxide/ Dioxide/ Hydrogen Sulphide/ Ammonia) • Piping/ tanks containing chemicals • Potential for trapped gases (Pockets of gas) • Pyrophoric materials (ignites in Oxygen) • Toxic gases/ carcinogens • Unapproved chemical	• Equipment dropped to water • Soil contamination • Spill/ Chemical to water • Windblown litter	• Compressors and transformer • Exposed energized systems • Lighting and batteries • Overhead power lines • Portable electrical equipment • Static Electricity • Underground/ buried electrical cables • Unguarded or exposed electrical equipment	• Anchor point/ lifting equipment (chains/ slings/ harness) • Cave–In • Converging/ sloping/ slippery surfaces • Fall from height /climbing • Inadequate/ restricted entry & exit • Moving/ dropped/ falling objects • Roof/ walkway/ platform/ handrails • Scaffolding /Elevated Work Platform/ Roof Collapse • Shifting Loads/ Materials • Structural collapse (incl adjacent) • Suspended in harness • Uneven ground/ same level fall	• Equipment Failure (Brakes, lights, pumps, valves and tools) • Equipment under tension e.g., springs • Exposed drive belts/ conveyors • Exposed Rotating Machinery/ Rollers/Screw conveyors

Table 4. Hazard Category Reference Table - pg.2

Motion	Noise	Pressure	Psychosocial	Radiation	Temperature	Vibration
• Aircraft transportation • Anchoring / deck lines / ropes • Congested Work Area • Ejected debris/tool parts • Equipment/ Crane Overloading • Excavation Equipment • Foreign body in eye • Line of fire & Pinch points -Hands/ fingers/ feet/ legs • Line of fire -Body position -Shifting and swinging loads • Marine vessel transportation • Moving Vehicles/ Plant • Road conditions • Vehicle/Plant turnover • Water ingress	• Equipment noise e.g. grinding, chipping, engines • High-pressure release • Impact noise • Sirens and alarms	• Cylinders/ Tanks/ Vessels • Exposed piping • Hoses • Pneumatic/ Hydraulic • Underground piping	• Aggression, violence • Bullying, harassment • Heavy workload • Human factors (Fatigue, lapses in focus) • Lone worker • Low resource/ inadequate skills • Monotonous tasks • Poor communications • Stress • Unpleasant tasks	• Ionising - X-Ray (Sources) • Ionising- Lasers • Ionising- Radon • Non-ionising - Radio frequency and microwaves • Non-ionising- Crack detection equipment • Non-ionising- Lasers • Non-ionising- Power Lines • Non-ionising- Radiant heat • Non-ionising- UV e.g. Sun, lighting, water treatment • Non-ionising -Welding arc	• Cooking and heating appliances • Exposure to extreme weather conditions (wind, rain, fog) • Flammable/ Combustible material (incl vegetation) • Friction (Ignition Source) • Hot/ Cold Surfaces • Ignition Sources (Process/ Tools/ Vehicles) • Steam • Thermal discomfort	• Whole body vibration • Hand/arm vibration

Table 5. DEI Construction Hazard Risk Matrix

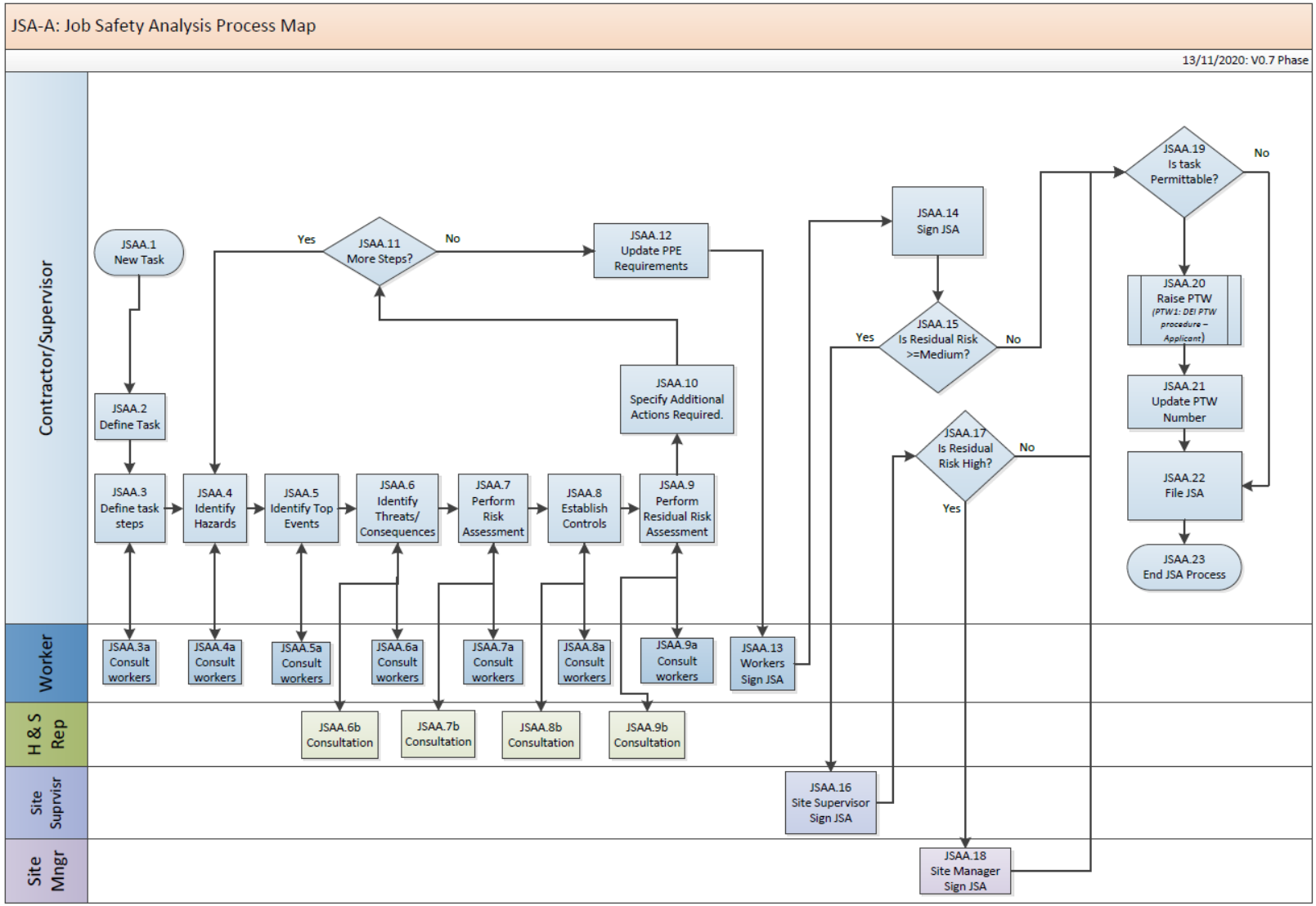
DEI Construction Hazard Risk Matrix

(e.g. Risk rating VERY HIGH (3,5), where "3,5" indicates impact level 3 (Major) and likelihood level 5 (Almost Certain)).

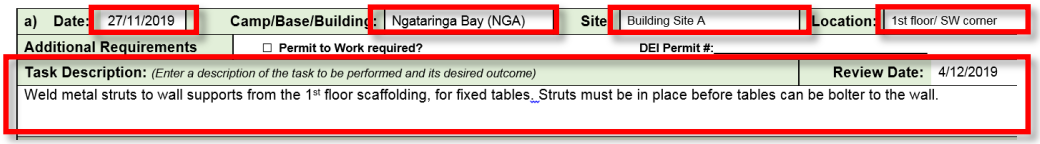
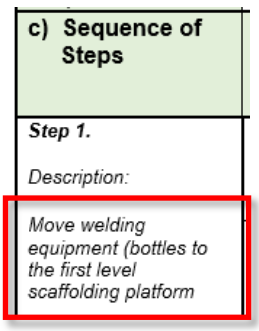
		IMPACT →				
		Minor	Moderate	Major	Extreme	
	Environment	Temporary damage contained within NZDF estate; short-term, local detrimental effect.	Localised damage with some impact on external environment; serious detrimental effect that requires remedial action.	Extensive or serious damage to the environment; long term detrimental effect requires immediate remedial action.	Extensive, irreversible damage to the environment; extensive long term detrimental impact.	
	Health & Safety	First aid injury. Minimal lost time. Temporary partial disability. No long term effects.	Medical attention required. Short term lost time. Permanent partial disability. Medium to long term effects.	Serious injury/illness/mental harm. Long term lost time. Permanent total disability. Long term effects.	Fatality. Multiple instances of serious physical or mental incapacity or ill health. Multiple cases of long term lost time. Multiple permanent total disability. Long term effects.	
Likelihood ↑	Could be expected to occur in most circumstances.	Almost Certain	MEDIUM (1,5)	HIGH (2,5)	VERY HIGH (3,5)	VERY HIGH (4,5)	5
	Could probably occur in most circumstances.	Likely	LOW (1,4)	HIGH (2,4)	VERY HIGH (3,4)	VERY HIGH (4,4)	4
	Could occur at some time.	Possible	LOW (1,3)	MEDIUM (2,3)	HIGH (3,3)	VERY HIGH (4,3)	3
	Could occur at some time, but is improbable.	Unlikely	LOW (1,2)	MEDIUM (2,2)	MEDIUM (3,2)	HIGH (4,2)	2
	Could occur in exceptional circumstances.	Rare	LOW (1,1)	LOW (2,1)	MEDIUM (3,1)	HIGH (4,1)	1
			1	2	3	4	

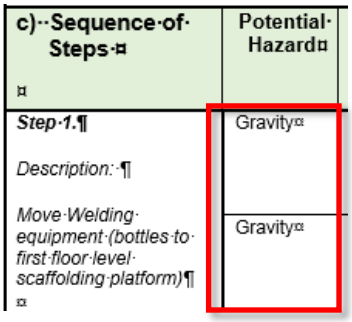
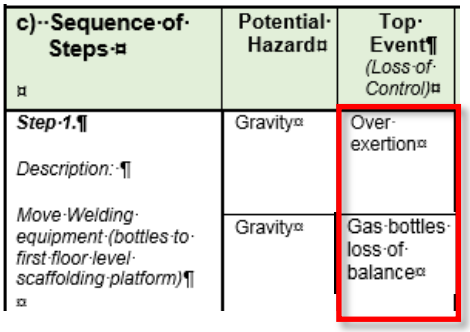
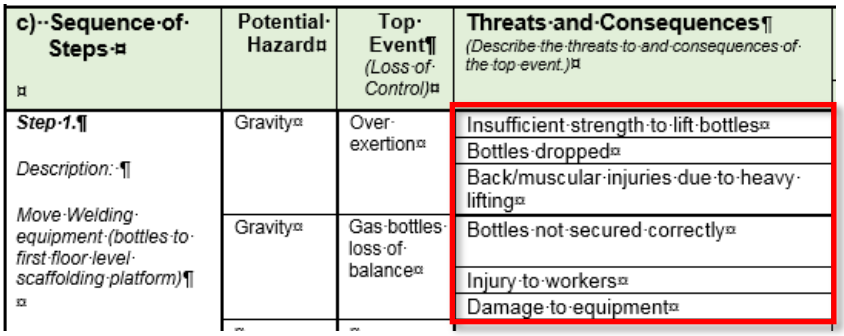
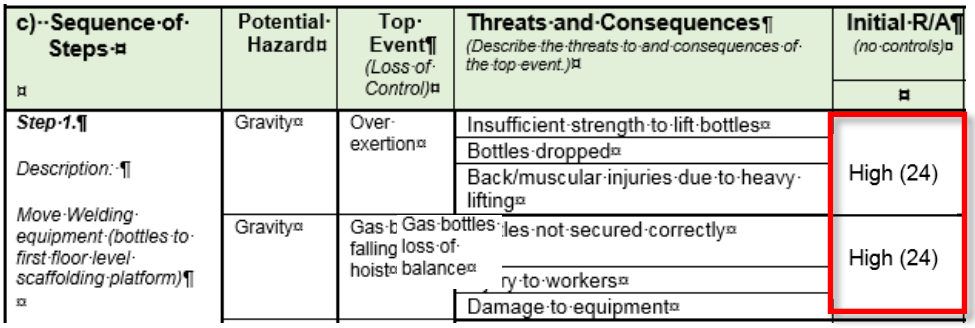
VERY HIGH	HIGH	MEDIUM	LOW
Intolerable. Further treatment required as matter of priority. **Action required:** Develop treatment strategies or introduce appropriate controls, with the objective of reducing the risk to a lower level. Activities with a residual risk level of *VERY HIGH* **m**ust not proceed. Review at least monthly or if a significant change occurs.	**Generally Intolerable.** Further treatment required to be identified as matter of priority. **Action required:** Develop treatment strategies or introduce appropriate controls, with the objective of reducing the risk to a lower level. Activities with a residual risk level of ***High*** will require approval from the Site Supervisor and the Site Manager before work can commence on the task.	**Generally Tolerable.** Further treatment may be required where practicable. **Action required:** Develop treatment strategies or introduce appropriate controls, with the objective of reducing the risk to a lower level. Activities with a residual risk level of ***Medium*** or higher will require approval from relevant commanders and senior management before work can commence on the task.	**Tolerable.** Unlikely to require further treatment. **Action Required:** The risk may be able to be managed by routine procedures. Minimal resource allocation or management effort required. In most cases these risks need no special precautions or actions, other than periodic monitoring of controls to ensure that the level of the risk has not changed.

10 JSA1: Job Safety Analysis Process Map



11 Job Safety Analysis Procedure

Step #	Description Detail
JSAA.1 – NEW TASK	For all new tasks a Job Safety Analysis (JSA) must be created to encourage dialog amongst workers and provide a focus for health and safety on the worksite. Many tasks may be determined as having few or negligible health and safety implications however this cannot be determined without proper analysis. Any tasks that are: – Notifiable to WorkSafe; – Permittable, according to the DEI Permit to Work Policy; or – Have an initial risk rating of medium or above, must have a completed JSA prior to work commencing. A JSA must accompany all Permits to Work. A primary function of a JSA is to encourage a health and safety dialogue among the people that are performing the task. Print the blank JSA and record the outcomes by hand while consulting staff regarding the best processes to follow.
JSAA.2 – DEFINE TASK	***Section a)*** Specify the date the JSA is being created, the location the task is to be performed at, and a description of the task and its outcome. The review date should be 7 days after the creation date.  a) Date: 27/11/2019 | Camp/Base/Building: Ngataringa Bay (NGA) | Site: Building Site A | Location: 1st floor/ SW corner Additional Requirements | ☐ Permit to Work required? | DEI Permit #: Task Description: *(Enter a description of the task to be performed and its desired outcome)* | Review Date: 4/12/2019 Weld metal struts to wall supports from the 1st floor scaffolding, for fixed tables. Struts must be in place before tables can be bolter to the wall.
JSAA.3 – DEFINE TASK STEPS	***Section b)*** Consulting workers familiar with the task, list each logical step required to complete the task. Typically, tasks may take up to eight or nine steps to complete. Copy and add additional pages to the JSA, as required. If a task has more than 15 steps, consider breaking it up into more than one task. Each step should be an action, not a description of how the step is performed. Specify the step number and description of each step.  c) Sequence of Steps *Step 1.* *Description:* *Move welding equipment (bottles to the first level scaffolding platform*

JSAA.4 – IDENTIFY HAZARDS	Consulting workers familiar with the task, identify the hazard (or hazards) that could cause the top event to occur. List each identified hazard.  A list of hazard categories and common associated hazards can be found in the *Hazard Category Reference Table*.
JSAA.5 – IDENTIFY TOP EVENTS	Consulting workers familiar with the task, identify the "top events" that may be caused by each hazard. These are the events that would occur during a "lose of control" situation. 
JSAA.6 – IDENTIFY THREATS/ CONSEQUENCES	Consulting workers familiar with the task, identify the threats that may cause the top event, and it's consequences. 
JSAA.7 – PERFORM RISK ASSESSMENT	Consulting with workers and Health and Safety specialists, assess the risk of the top event. That is, the probability of the event and the severity of the consequences. Use *Error! eference source not found.* to determine the risk level. 

JSAA.8 – ESTABLISH CONTROLS

Consulting with workers and Health and Safety representatives and advisors, determine the most appropriate controls to best mitigate the hazards and risks inherent in the task.

Threats and Consequences (Describe the threats to and consequences of the top event.)	Initial R/A (no controls)	Controls (Describe the control methods to be used to mitigate the risk and identify the level of the control)	
		Control description	Level
Insufficient strength to lift bottles	High (24)	Use mini hoist to lift gas bottles	2
Bottles dropped		Use mini hoist to lift gas bottles	2
Back/muscular injuries due to heavy lifting		Use mini hoist to lift gas bottles	2
Bottles not secured correctly	High (24)	Ensure safety chains are secured properly to bottle trolleys when moving lifting bottles	3
Injury to workers		Ensure area below bottles is clear of staff	4
Damage to equipment		Ensure area below bottles is clear of equipment	4

Select the highest appropriate level of controls to ensure the safety of employees performing hazardous tasks (see ***Figure 2. Hierarchy of Controls Pyramid.***)

Note: Always be aware that while controls may mitigate some hazards, they may also introducing others that will have to be addressed.

JSAA.9 – PERFORM RESIDUAL RISK ASSESSMENT

Consulting with workers and Health and Safety representatives and advisors, assess the risk of the top event if the specified controls are implemented. That is, the probability of the event still occurring and the severity of the consequences. Use the *Error! Reference source not found.* o determine the risk level.

Initial R/A (no controls)	Controls (Describe the control methods to be used to mitigate the risk and identify the level of the control)		Residual R/A (with controls)
	Control description	Level	
High (24)	Use mini hoist to lift gas bottles	2	Low (11)
	Use mini hoist to lift gas bottles	2	
	Use mini hoist to lift gas bottles	2	
High (24)	Ensure safety chains are secured properly to bottle trolleys when moving lifting bottles	3	Low (11)
	Ensure area below bottles is clear of staff	4	
	Ensure area below bottles is clear of equipment	4	

The aim of the implemented controls should be to lower the risk level to "Low".

Note: Tasks with a residual risk level of *Medium* must have special authorisation from the Site Supervisor, and those with a residual risk of High must be authorised by the Site Manager, before the task can begin.

JSAA.10 – SPECIFY ADDITIONAL ACTIONS REQUIRED

Section c)

Note any additional action that may be required prior to the task step commencing.

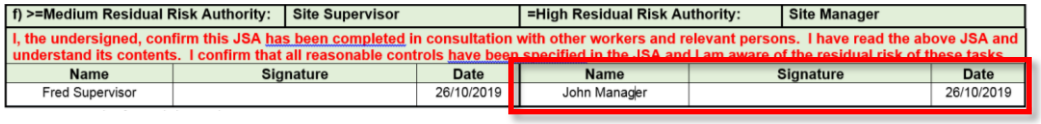
d) Action Items: (List any specific action items)	Check Joe's hoist operating certificate is current Check Gas bottles are full so we don't have to do it more than once.

JSAA.11 – MORE STEPS?

Are there any more steps required to complete the task?

- **Yes**: Go to step ***JSAA.3 – Define Task Steps***
- **No**: Go to step ***JSAA.12 – Update PPE requirement?***

JSAA.12 – UPDATE PPE REQUIREMENT?	Return to page one of the JSA and update the PPE and where applicable, the type of PPW that will be required for the task. **Required PPE:** *(Select Mandatory PPE required for the task)* PPE: Wash Hands ☐ · Safety Belts ☐ · Life Vests ☐ · High Viz ☐ · Gloves ☒ · Hard Hats ☐ · Ear plugs/muffs ☐ · Foot protection ☒ · Lab coat ☐ · Protective clothing ☐ · Safety glasses ☐ · Opaque glasses ☐ · Face shield ☐ Type: Nylex · Steel cap
JSAA.13 – WORKERS SIGN JSA	***Section d)*** Have all workers that will be involved in the execution of the task, enter their name and sign the JSA, indicating they have read and understood the requirements of the JSA. **d) Team Members:** *(Enter the name of each team member involved performing the task. Each team member must sign the JSA before the task is commenced)* I, the undersigned, confirm this JSA has been completed in consultation with other workers and relevant persons. I have read the above JSA and understand its contents. I confirm that I have the skills, experience, knowledge, training and relevant certifications to perform my role in this task. I agree to comply with the safety requirements within this JSA, including safe work instructions and the use of Personal Protective Equipment. Name / Signature / Date: Joe Smith 26/10/2019; Pete Bend 26/10/2019; Harry Mans 26/10/2019
JSAA.14 – SIGN JSA	***Section e)*** Sign the JSA and have it signed by the Task Supervisor, to indicate they have read and understood its requirements. **g) JSA Originator:** *(Name and signature of the person originating the Job Safety Analysis)* / **Task Supervisor:** *(Name and signature of the person Supervising the task)* Name / Signature / Date: Bill Paper 29/10/2019; John Overlord 29/10/2019
JSAA.15 – IS RESIDUAL RISK => MEDIUM	If a JSA has any tasks with a residual risk of Medium or higher, the Site Supervisor must sign the JSA to indicate all possible controls have been considered and staff are aware of the risk described. Do any tasks have a residual risk of Medium or above? - **Yes**: Go to step ***JSAA.16 – Site Supervisor sign JSA*** - No: Go to step JSAA.19 – Is Task Permittable
JSAA.16 – SITE SUPERVISOR SIGN JSA	***Section f)*** Have the Site Supervisor sign the JSA to indicate they are aware of the residual risk and that all reasonable steps have been considered to make the task as safe as possible. **f) >=Medium Residual Risk Authority:** Site Supervisor / **=High Residual Risk Authority:** Site Manager I, the undersigned, confirm this JSA has been completed in consultation with other workers and relevant persons. I have read the above JSA and understand its contents. I confirm that all reasonable controls have been specified in the JSA and I am aware of the residual risk of these tasks. Name / Signature / Date: Fred Supervisor 26/10/2019; John Manager 26/10/2019
JSAA.17 – IS RESIDUAL RISK => MEDIUM	If a JSA has any tasks with a residual risk of High, the Site Manager must sign the JSA to indicate all possible controls have been considered and staff are aware of the risk described. Do any tasks have a residual risk of High? - **Yes**: Go to step ***JSAA.18 – Site Manager sign JSA***

	- No: Go to step JSAA.19 – Is Task Permittable
JSAA.18 – SITE MANAGER SIGN JSA	***Section f)*** Have the Site Supervisor sign the JSA to indicate they are aware of the residual risk and that all reasonable steps have been considered to make the task as safe as possible.  f) >=Medium Residual Risk Authority: | Site Supervisor | =High Residual Risk Authority: | Site Manager I, the undersigned, confirm this JSA has been completed in consultation with other workers and relevant persons. I have read the above JSA and understand its contents. I confirm that all reasonable controls have been specified in the JSA and I am aware of the residual risk of these tasks Name | Signature | Date | Name | Signature | Date Fred Supervisor | 26/10/2019 | John Manager | 26/10/2019
JSAA.19 – IS TASK PERMITTABLE	A DEI Permit to Work is required for all permittable work (as defined in *Error! Reference source ot found.**).*** Is the task permittable? - **Yes**: Go to step ***JSAA.20 – Raise PTW*** - No: Go to step JSAA.21 – Update
JSAA.20 – RAISE PTW	Follow procedure ***PTW1: Permit to Work – Application Procedure*** to raise a Permit to work for the task.
JSAA.21 – UPDATE PTW NUMBER	***Section e)*** Indicate on page one of the JSA that the task requires a permit to work and include the Permit to Work number.  Additional Requirements | ☒ Permit to Work required? | DEI Permit #: DPT - 25413 - 19245 – 1 ____
JSAA.22 – FILE JSA	File JSA for future reference.
JSAA.23 – END	**End of Process**

Appendix A **Job Safety Analysis Form (Sample)**

DEI Construction Job Safety Analysis

JSA number:

(Enter only the hazards and controls that are required for each step. (Refer to pages 7 and 8 for risk assessment and hazards references.)

a) Date: Date.	Camp/Base/Building: Choose an item.	Site:	Location:
Additional Requirements	☐ Permit to Work required?	DEI Permit #:_____	
Task Description: *(Enter a description of the task to be performed and its desired outcome)*			**Review Date:** Date.

Required PPE: *(Select Mandatory PPE required for the task)*

PPE type: Hard Hats ☐ | Safety Boots ☐ | Life Vests ☐ | High Vis ☐ | Gloves ☐ | Hard Hats ☐ | Ear muffs/muffs ☐ | Face screen/eye ☐ | Safety vest ☐ | Protective clothing ☐ | Goggles ☐ | Dust/gas masks ☐ | Face masks ☐ | Welding mask ☐ | Face mask ☐ | Respirator ☐ | Breathing apparatus ☐ | Harness ☐ | Other PPE ☐ List:

b) Sequence of Steps	Potential Hazard	Top Event (Loss of Control)	Threats and Consequences (Describe the threats to and consequences of the top event.)	Risk of Loss of Control	Controls (Describe the control methods to be used to mitigate the risk and identify the level of the control) — Control description	Level	Residual Risk (with controls in place)
Step 1. *Description:*				Risk Level		#	Risk Level
						#	
						#	
				Risk Level		#	Risk Level
						#	
						#	
				Risk Level		#	Risk Level
						#	
						#	
				Risk Level		#	Risk Level
						#	
						#	
c) Action Items: *(List any specific action items.)*							

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Classification: IN CONFIDENCE
Business Activity: Safety Governance and Planning

DEI Job Safety Analysis

b) Sequence of Steps	Potential Hazard	Top Event (Loss of Control)	Threats and Consequences (Describe the threats to and consequences of the top event.)	Risk of Loss of Control	Controls (Describe the control methods to be used to mitigate the risk and identify the level of the control) — Control description	Level	Residual Risk (with controls in place)
Step 8. *Description:*				Risk Level		#	Risk Level
						#	
						#	
				Risk Level		#	Risk Level
						#	
						#	
				Risk Level		#	Risk Level
						#	
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				Risk Level		#	Risk Level
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				Risk Level		#	Risk Level
						#	
						#	
c) Action Items: *(List any specific action items.)*							
Step 9. *Description:*				Risk Level		#	Risk Level
						#	
						#	
				Risk Level		#	Risk Level
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				Risk Level		#	Risk Level
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				Risk Level		#	Risk Level
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						#	
c) Action Items: *(List any specific action items.)*							

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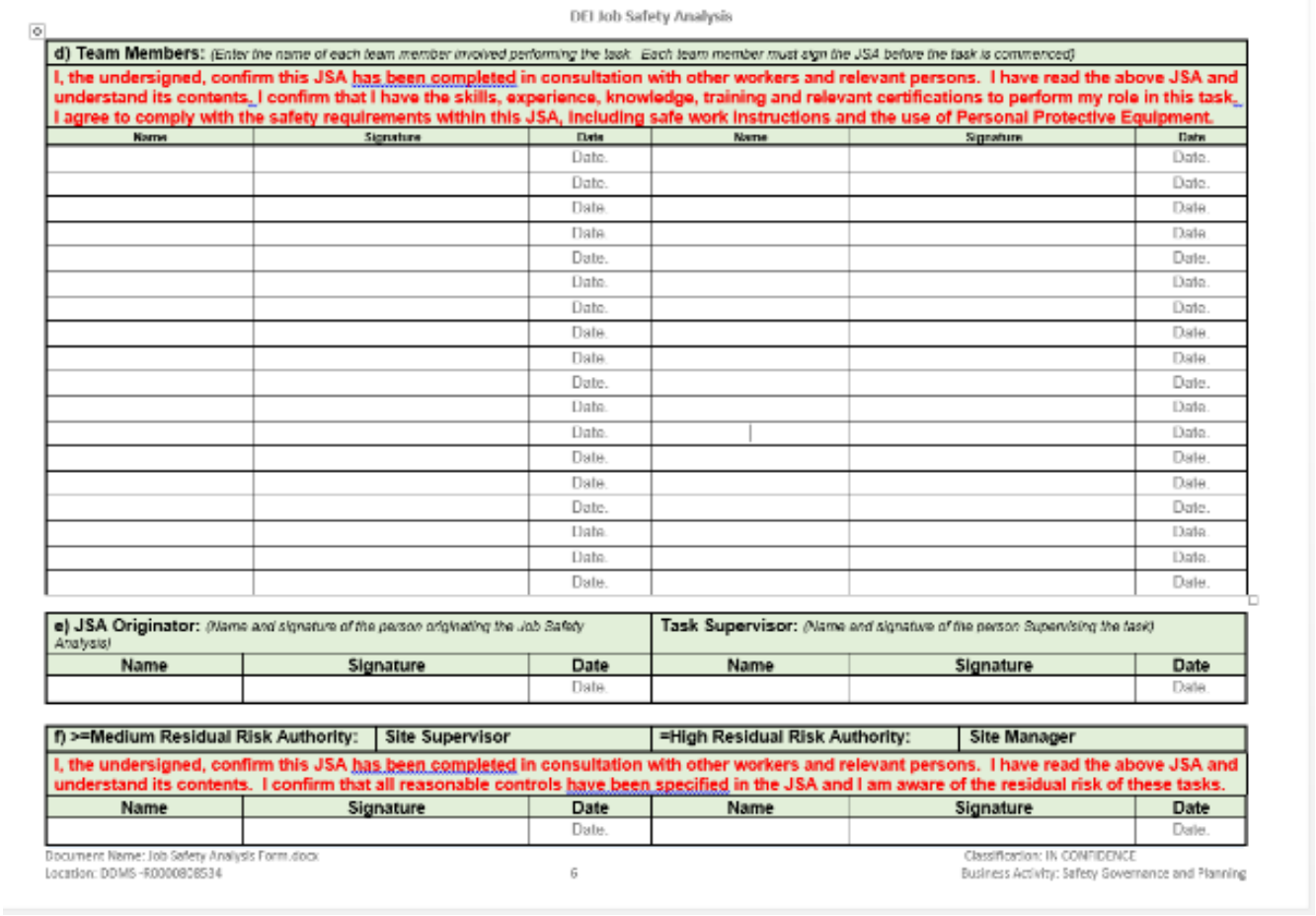
5
Classification: IN CONFIDENCE
Business Activity: Safety Governance and Planning



DEI Job Safety Analysis

d) Team Members: (Enter the name of each team member involved performing the task. Each team member must sign the JSA before the task is commenced)					
I, the undersigned, confirm this JSA has been completed in consultation with other workers and relevant persons. I have read the above JSA and understand its contents. I confirm that I have the skills, experience, knowledge, training and relevant certifications to perform my role in this task. I agree to comply with the safety requirements within this JSA, including safe work instructions and the use of Personal Protective Equipment.					
Name	Signature	Date	Name	Signature	Date
		Date.			Date.
		Date.			Date.
		Date.			Date.
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		Date.			Date.
		Date.			Date.

e) JSA Originator: (Name and signature of the person originating the Job Safety Analysis)			Task Supervisor: (Name and signature of the person Supervising the task)		
Name	Signature	Date	Name	Signature	Date
		Date.			Date.

f) >=Medium Residual Risk Authority:	Site Supervisor		=High Residual Risk Authority:	Site Manager	
I, the undersigned, confirm this JSA has been completed in consultation with other workers and relevant persons. I have read the above JSA and understand its contents. I confirm that all reasonable controls have been specified in the JSA and I am aware of the residual risk of these tasks.					
Name	Signature	Date	Name	Signature	Date
		Date.			Date.

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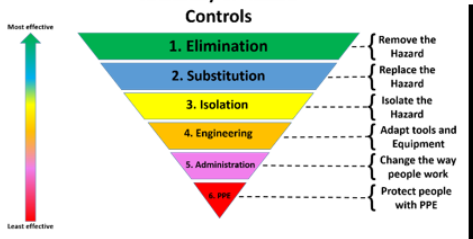
6
Classification: IN CONFIDENCE
Business Activity: Safety Governance and Planning

Risk Level

DEI Job Safety Analysis

Hierarchy of Hazard Controls



DEI Construction Hazard Risk Matrix

	IMPACT			
Environment	Temporary damage contained within NZDF estate; short-term, local detrimental effect.	Localised damage with some impact on external environment; serious detrimental effect that requires remedial action.	Extensive or serious damage to the environment; long term detrimental effect requires immediate remedial action.	Extensive, irreversible damage to the environment; extensive long term detrimental impact.
Health & Safety	First aid injury. Minimal lost time. Temporary partial disability. No long term effects.	Medical attention required. Short term lost time. Permanent partial disability. Medium to long term effects.	Serious injury/illness/mental harm. Long term lost time. Permanent total disability. Long term effects.	Fatality. Multiple instances of serious physical or mental incapacity or ill health. Multiple cases of long term lost time. Multiple permanent total disability. Long term effects.

Likelihood	Probability		Minor	Moderate	Major	Extreme	
↑	Could be expected to occur in most circumstances.	Almost Certain	MEDIUM (1,5)	HIGH (2,5)	VERY HIGH (3,5)	VERY HIGH (4,5)	5
	Could probably occur in most circumstances.	Likely	LOW (1,4)	HIGH (2,4)	VERY HIGH (3,4)	VERY HIGH (4,4)	4
	Could occur at some time.	Possible	LOW (1,3)	MEDIUM (2,3)	HIGH (3,3)	VERY HIGH (4,3)	3
	Could occur at some time, but is improbable.	Unlikely	LOW (1,2)	MEDIUM (2,2)	MEDIUM (3,2)	HIGH (4,2)	2
	Could occur in exceptional circumstances.	Rare	LOW (1,1)	LOW (2,1)	MEDIUM (3,1)	HIGH (4,1)	1
	(e.g. Risk rating VERY HIGH (3,5), where "3,5" indicates impact level 3 (Major) and likelihood level 5 (Almost Certain)).		1	2	3	4	

VERY HIGH	HIGH	MEDIUM	LOW
Intolerable. Further treatment required as matter of priority. **Action required:** Develop treatment strategies or introduce appropriate controls, with the objective of reducing the risk to a lower level. Activities with a residual risk level of *VERY HIGH* must not proceed. Review at least monthly or if a significant change occurs.	**Generally Intolerable.** Further treatment required to be identified as matter of priority. **Action required:** Develop treatment strategies or introduce appropriate controls, with the objective of reducing the risk to a lower level. Activities with a residual risk level of *High* will require approval from the Site Supervisor and the Site Manager before work can commence on the task.	**Generally Tolerable**. Further treatment may be required where practicable. **Action required:** Develop treatment strategies or introduce appropriate controls, with the objective of reducing the risk to a lower level. Activities with a residual risk level of *Medium* or higher will require approval from relevant commanders and senior management before work can commence on the task.	**Tolerable.** Unlikely to require further treatment. **Action Required:** The risk may be able to be managed by routine procedures. Minimal resource allocation or management effort required. In most cases these risks need no special precautions or actions, other than periodic monitoring of controls to ensure that the level of the risk has not changed.

Hazard Category Reference Table

Table 3 Hazard Category Reference Table - pg.1

Biological	Biomechanical	Chemical	Ecological	Electrical	Gravity	Mechanical
• Airborne fibres/ particulates e.g. Asbestos • Bacteria • Blood Bourne Pathogens • Contaminated Soil • Contaminated Water • Fungi/ mould • Hygiene concerns • Insect/ Animal bites or stings • Vapours/ Dust/ Fumes/ Exhausts • Viruses • Water immersion	• Body position, uncomfortable position • Eye strain • Muscular overexertion/ manual handling • Repetitive operations • Working Posture	• Chemical transfer activities • Contamination dust, chemicals, sediment, effluent non segregated waste • Corrosives • Depleted oxygen • Explosives • Flammable vapours/ materials • Gasses (Oxygen, Carbon Monoxide/ Dioxide/ Hydrogen Sulphide/ Ammonia) • Piping/ tanks containing chemicals • Potential for trapped gases (Pockets of gas) • Pyrophoric materials (ignites in Oxygen) • Toxic gases/ carcinogens • Unapproved chemical	• Equipment dropped to water • Soil contamination • Spill/ Chemical to water • Windblown litter	• Compressors and transformer • Exposed energized systems • Lighting and batteries • Overhead power lines • Portable electrical equipment • Static Electricity • Underground/ buried electrical cables • Unguarded or exposed electrical equipment	• Anchor point/ lifting equipment (chains/ slings/ harness) • Cave–In • Converging/ sloping/ slippery surfaces • Fall from height /climbing • Inadequate/ restricted entry & exit • Moving/ dropped/ falling objects • Roof/ walkway/ platform/ handrails • Scaffolding /Elevated Work Platform/ Roof Collapse • Shifting Loads/ Materials • Structural collapse (incl adjacent) • Suspended in harness • Uneven ground/ same level fall	• Equipment Failure (Brakes, lights, pumps, valves and tools) • Equipment under tension e.g., springs • Exposed drive belts/ conveyors • Exposed Rotating Machinery/ Rollers/Screw conveyors

Table 4 Hazard Category Reference Table - pg.2

Motion	Noise	Pressure	Psychosocial	Radiation	Temperature	Vibration
• Aircraft transportation • Anchoring / deck lines / ropes • Congested Work Area • Ejected debris/tool parts • Equipment/ Crane Overloading • Excavation Equipment • Foreign body in eye • Line of fire & Pinch points - Hands/ fingers/ feet/ legs • Line of fire -Body position -Shifting and swinging loads • Marine vessel transportation • Moving Vehicles/ Plant • Road conditions • Vehicle/Plant turnover • Water ingress	• Equipment noise e.g. grinding, chipping, engines • High-pressure release • Impact noise • Sirens and alarms	• Cylinders/ Tanks/ Vessels • Exposed piping • Hoses • Pneumatic/ Hydraulic • Underground piping	• Aggression, violence • Bullying, harassment • Heavy workload • Human factors (Fatigue, lapses in focus) • Lone worker • Low resource/ inadequate skills • Monotonous tasks • Poor communications • Stress • Unpleasant tasks	• Ionising - X-Ray (Sources) • Ionising- Lasers • Ionising- Radon • Non-ionising - Radio frequency and microwaves • Non-ionising- Crack detection equipment • Non-ionising- Lasers • Non-ionising- Power Lines • Non-ionising- Radiant heat • Non-ionising- UV e.g. Sun, lighting, water treatment • Non-ionising - Welding arc	• Cooking and heating appliances • Exposure to extreme weather conditions (wind, rain, fog) • Flammable/ Combustible material (incl vegetation) • Friction (Ignition Source) • Hot/ Cold Surfaces • Ignition Sources (Process/ Tools/ Vehicles) • Steam • Thermal discomfort	• Whole body vibration • Hand/arm vibration

Appendix B **Notifiable, Restricted And Permittable Work**

1. Notifiable Work - *Health and Safety in Employment Regulations* 1995 – consisting of:

   a. Commercial logging or tree felling operations;
   b. Construction work involving one or more of the following;

      (1) Work in which a person may fall five metres or more, other than (the following exclusions):
         1. Work in connection with a residential building up to and including two full storeys;
         2. Work on overhead telecommunication lines and overhead electric power lines;
         3. Work carried out from a ladder only;
         4. Maintenance and repair work of a minor or routine nature;

      (2) The **erection or dismantling or scaffolding** from which any person may fall five metres or more;
      (3) Work **using a lifting appliance** where the appliance has to lift a mass of 500 kilograms of more a vertical distance of five metres or more, other than work using an excavator, a fork-lift, or a self-propelled mobile crane;
      (4) Work in any **pit, shaft, trench, or other excavation** in which any person is required to work in a space more than 1.5 metres deep and having a depth greater than the horizontal width at the top;
      (5) Work in any **drive, excavation, or heading** in which any person is required to work with a ground cover overhead;
      (6) Work in **any excavation** in which any face has a vertical height of more than five metres and an average slope steeper than a ratio of one horizontal to two vertical;
      (7) Work in which **any explosive** is used or in which any explosive is kept on site for the purpose of being used;
      (8) Work in which **any person breathes air that is compressed** or a respiratory medium other than air.

2. Restricted Work - Health and Safety in Employment (Asbestos) Regulations 1998 consisting of:

   a. Work involving asbestos, if the asbestos is friable, and is or has been used in connection with thermal or acoustic insulation, or fire protection, in buildings, ships, structures, or vehicles;
   b. Work involving asbestos, if the asbestos concerned is friable and is or has been used in connection with lagging around boilers, ducts, furnaces, or pipes;
   c. The demolition of maintenance of anything, including a building or a part of a building, containing friable asbestos;
   d. The encapsulation of materials containing friable asbestos;
   e. The use, on asbestos cement or other bonded product containing asbestos, of_
      (1) A power tool with any kind of cutting blade or abrasive device, except when it is used with dust control equipment; or
      (2) Any other equipment whose use may result in the release of asbestos dust, except when it is used with dust control equipment.
   f. Dry sanding of floor coverings containing asbestos.

3. **NZDF Permittable Work** – Defined as work considered potentially hazardous by NZDF and not listed in the regulations:

   a. **Phone and data cables** – while the work itself is not intrinsically hazardous, although other factors such as working in excavations or at height may come into play, the potential for loss of service to vital defence activities makes this a permitted activity;

b. **Hot work** – defined as any work where the temperatures generated are likely to ignite surrounding materials, e.g. cutting and welding, metal grinding, blow lamps and other equipment producing sparks, heat or a naked flame;

c. **High voltage electrical work** – defined as any activity involving electricity lines or electrical equipment rated at 1000v or higher.

d. **Gas works** – defined as any activity connected to the installation, maintenance or repair of pipes, fittings, plant or equipment related to reticulated or bottled natural gas, CNG or LPG.

e. **Pipe works** – defined as any activity connected to the installation, maintenance, or repair of pipes and pipelines, fittings, plant or equipment relating to reticulated water, petroleum products, or other liquids or gases (not natural gas, CNG or LPG).

f. **Deactivation of warning or protective alarm** - defined as any activity causing a partial or complete de-activation of a warning or protective system e.g. security, fire, or emergency, for any time period.

g. **Confined Space** – defined as any activity occurring wholly or partly in a confined workspace as defined in AS 2865:1995 Safe Working in a Confined Space.

h. **Working at Height –** defined in Work Safe NZ 'Working at Height Toolkit' Factsheets 1-6.

i. **Penetrating ground or structural works** requiring ground or structural penetration of any depth, with any device, for the purpose of:
   a. altering a structure;
   b. fixing a structure or object in place;
   c. testing ground stability for foundations;
   d. stabilise slopes;
   e. recovering a resource e.g. water, or
   f. disposing of any substance.

j. **Any other activity** that may impact on surface and subsurface installations, structures, and plant that involves:

   a. Blasting;
   b. Excavation or other land disturbance;
   c. Placing of trees or plants;
   d. Placing of any matter or thing on or in the land;
   e. Loading of the soil; and the
   f. Movement by heavy vehicles or heavy machinery weighing over 4.5 tonnes.

12 Document Control

12.1 Document authorisation

Document	Name or person	Title
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12.4 Document dependencies

The following related documents may require review or amendment if this document changes.

Document name	Location (link/path)
CHESS forms and templates	http://ddms-r/ds/D0-0221/14/Forms/AllItems.aspx
CHESS - Policies and Specifications	http://ddms-r/ds/D0-0221/14/Forms/AllItems.aspx
CHESS – DEI health and Safety Guide	http://ddms-r/ds/D0-0221/14/Forms/AllItems.aspx
ICE-A Contractor Non-Conformance Reporting Procedure	http://ddms-r/ds/D0-0221/14/Forms/AllItems.aspx
IMS-A Incident Response Procedure (Contractor)	http://ddms-r/ds/D0-0221/14/Forms/AllItems.aspx
DEI Incident Management System – Incident Response Process Map	http://ddms-r/ds/D0-0221/14/Forms/AllItems.aspx
DEI Job Safety Analysis Process Map	http://ddms-r/ds/D0-0221/14/Forms/AllItems.aspx
JSA-A Job Safety Analysis procedure	http://ddms-r/ds/D0-0221/14/Forms/AllItems.aspx
DEI PTW Process Map	http://ddms-r/ds/D0-0221/14/Forms/AllItems.aspx
PTW-A Permit to Work - Application Procedure	http://ddms-r/ds/D0-0221/14/Forms/AllItems.aspx
SPA Specification Amendment Request Process Map	http://ddms-r/ds/D0-0221/14/Forms/AllItems.aspx
SPA-A Contractor Specification Amendment Request Procedure	http://ddms-r/ds/D0-0221/14/Forms/AllItems.aspx