



**HAZARD
CONTROL
TECHNICAL GUIDE**



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HAZARDS

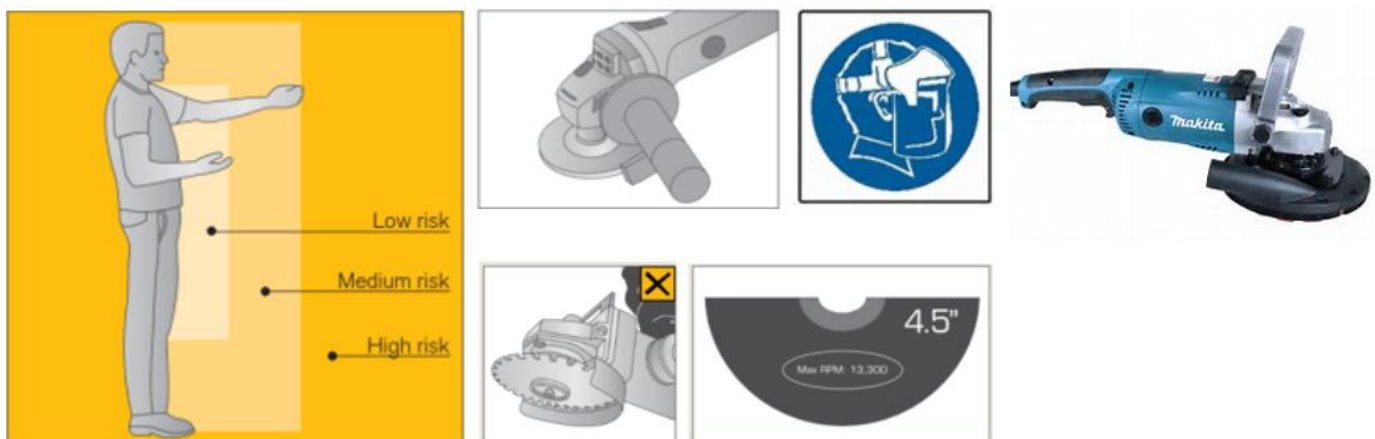
The most common causes of injury to operators from angle grinders are lacerations from attachments that break and become projectiles, and lacerations from angle grinder kickbacks.

Planning must consider if there is a safer way to achieve the end outcome (e.g. using a bench-mounted saw for cutting). Where grinder operations are to be utilised then:

MCNAB MINIMUM STANDARD FOR GRINDERS

- Guards must be in place and secure and ensure that the correct guard supplied by manufacturer is used;
- Before use, ensure the auxiliary handle is attached (see picture); Use two hands to hold the power tool, one on the auxiliary handle and the other on the body;
- Ensure the work piece is secured and supported;
- Double eye protection or goggles to be worn at all times whilst using a grinder (see picture);
- Operator must be competent in performing the task safely;
- Only use angle grinders that are the appropriate size for the task and only the right sized accessory for the size of the tool used;
- Only use attachments designed for use on angle grinders and task being performed (cut off disc for cutting and an abrasive disc for grinding);
- Do not use circular saw blades on angle grinders (see picture);
- Identify any surface coatings that may be dangerous when worked on (e.g. lead);
- Ensure the maximum speed (RPM) marked on the attachment is higher than the maximum speed of the angle grinder (see picture);
- Dust extraction attachments and adequate ventilation must be in place when grinding cement based products (see picture). Dust extraction devices must be in use when grinding/cutting any material containing Respirable Crystalline Silica (RCS.) See hazard control sheet 042 Respirable Dust Management for McNab's minimum standards;
- Ensure, where possible, work is positioned in the operator's best working zone – between shoulders and knees;
- Nine (9) Inch Grinder use is restricted on site to skilled trade persons/labourers who have received training and the Site Manager has approved their use on site;
- Ensure long hair is tied up and take off rings and jewellery;
- Ensure the power tool runs smoothly, with no vibration or wobbling (Let it run until it reaches full operation speed);
- Ensure the electrical lead is in good condition and has a current test and tag;
- Do not lock in the hold to run trigger

No apprentice or person under 21 is permitted to use nine (9) inch grinders



The purpose of this Hazard control sheet is to outline the requirements for the safe management of Asbestos related issues during all phases of works on a Construction workplace. Specific workplace conditions and jurisdictional requirements should always be taken into consideration.

Asbestos is always to be managed in accordance with *How to Manage and Control Asbestos in the Workplace Code of Practice 2021* and removal is to be performed in accordance with *How to Safely Remove Asbestos Code of Practice 2021*.

ASBESTOS MANAGEMENT PLANS AND REGISTERS

If a site is known to have asbestos containing materials McNab must request a copy of any Asbestos reports/Management plans and the Asbestos register from the Owner/Occupier prior to taking management control of the site, if it has not been provided. The register must record the location, type (friable or non-friable) and condition of the material, including any inaccessible areas likely to contain asbestos. Where Asbestos Registers that have not been reviewed or updated within the last 5 years or are not available/provided, an asbestos survey/audit must be performed by an Occupational Hygienist to provide an asbestos register for the site.

Note: An asbestos management plans and registers are not required to be prepared when:

- The workplace was constructed after 31 December 1989;
- No asbestos has been identified at the workplace;
- No asbestos is likely to be present at the workplace.

COMMUNICATION

Where to locate and access copies of any Asbestos reports, Management plans and the Asbestos registers must be communicated to all workers during site specific inductions. Photographs, maps and drawings may be developed and posted to assist.

Copies of these documents also need to be provided to the relevant trades to communicate the location and condition of asbestos needs to be communicated and understood by workers prior to any works which may disturb Asbestos or asbestos containing material.

Asbestos removal works must be communicated to all subcontractors and their workers as well as other personnel onsite as well as anyone occupying premises in immediate vicinity of the workplace, prior to the works commencing.

DISCOVERY

If any suspected asbestos or asbestos containing materials are discovered:

- The area of concern is to be isolated from all workers and / or members of the public;
- Contact an Occupational Hygienist to take samples of material for testing. If material sample is positive, it must be removed and disposed of by an appropriately licenced asbestos removalist.

ASBESTOS REMOVAL

Only licensed asbestos removalist are to remove asbestos and must give notice to Workplace Health and Safety Queensland (WHSQ) of licensed asbestos removal work at least five days before the work commences. Notification must be made using *Form 65: Notification of licensed asbestos removal work, demolition work or emergency demolition*, a copy of which must be provided to McNab and retained onsite.

ASBESTOS REMOVAL CONTROL PLANS

An Asbestos Removal Control Plan, identifying the location of asbestos, how the hazards and risks are to be controlled is to be prepared by the Licensed Asbestos removal Subcontractor to undertake the works and is to be submitted to McNab, including any subsequent updates to the plan. Asbestos control plans must include

the requirements defined within How to Safely Remove Asbestos Code of Practice 2021 - Appendix A – Asbestos removal control plan contents as a minimum.

A SWMS is to be developed for any asbestos disturbance or removal works, including destructive Asbestos Surveys/Audits (i.e. removal of building materials or fabric necessary to identify the presence of suspected or known asbestos material), removal of asbestos or work where there is a potential for asbestos to be disturbed.

TRAINING AND COMPETENCE

No persons are to remove any asbestos if they are not trained or qualified to do so. Records of training must be produced prior to commencement of works. This training must reflect the specific type of asbestos work to be undertaken. Records must be readily accessible and available for inspection at the removal area.

CONTAMINATED AREAS AND ASBESTOS WORK ZONES

The workplace and areas where asbestos removal is taking place should be clearly barricaded and defined to ensure that non-essential people do not enter and to delineate the contaminated/removal area. It is also necessary to warn persons that asbestos removal work is being carried out e.g. through the placement of barriers and signs. Barricades can take various forms, from tape to solid hoarding and plastic encapsulation. The location of barricades will depend on the physical environment and the level of risk. All barriers and warning signs should remain in place until a clearance to re-occupy has been received.



AIR MONITORING

A competent person (Occupational Hygienist), who is independent from the person responsible for the removal work, should determine all air monitoring requirements. Air monitoring should be performed whenever asbestos or asbestos containing material is being removed, to ensure the control measures are effective. Any air quality testing or exposure testing required must be undertaken by a suitable qualified person using appropriate monitoring and measurement equipment, that has been calibrated and maintained. Records confirming this will be kept at the workplace and produced on request.

The results of the air monitoring for asbestos must be given to the following:

- Workers
- Health and safety representatives
- PCBUS
- Other people at the workplace

CONTAMINATED WASTE

Onsite waste storage and disposal process must be detailed within the Asbestos removal control plan, detailing as a minimum, the location for waste storage at the workplace, the transport of such wastes, approvals needed from the relevant local disposal authority and any Jurisdictional requirements that may apply to the amount and dimensions of asbestos waste. Loose asbestos waste should not be allowed to accumulate. All waste should be bagged and wrapped in 200 µm plastic waste bag or suitable alternate waste

container dedicated for asbestos waste that is clearly labelled with an appropriate warning sign that clearly indicates asbestos waste.

All asbestos waste shall be removed from the workplace by a competent person and transported and disposed of in accordance with all relevant Jurisdictional legislative requirements and guidelines for the transport and disposal of asbestos waste e.g. is taken to a Licensed EPA approved tip, by a regulated waste transport company and the licence tip docket is received and retained as evidence.



CLEARANCE CERTIFICATES

Before clearance is granted for an asbestos work area to be re-occupied, there must be a thorough clearance inspection including review of the air monitoring results. The clearance inspection must be conducted by a competent person who is independent from the person responsible for the removal work e.g. an Occupational Hygienist. Following the final clearance inspection a clearance certificate must be issued by an Occupational Hygienist and is to be provided to McNab before the recommencement of any works.

RECORDS

All records of asbestos at a workplace and its removal (reports, monitoring records, contractor documentation, etc.) is to be kept at the workplace for the duration of the works, for reference as required. Records need to be kept for a period of 30 years for all airborne monitoring results and health monitoring records.

Note that exposed workers must be able to readily access their exposure records and must be provided with a copy of their health monitoring report. Records will be retained and accessible through the McNab HR Department.

Records are to be maintained of all contaminated soil/in-situ hazardous material or imported fill used or present on site, such as As-built drawings, Updated Asbestos Management plan and/or asbestos registers and Imported fill records and registers, to enable future traceability should health and safety issues arise.

INDUCTION, INFORMATION, TRAINING AND SUPERVISION

Inductions, Hazard Control Technical Guides, Project risk registers, SWMS for tasks and SDS for materials shall be used to communicate hazards and controls. McNab will induct, supervisors and workers in Asbestos hazards and supervise the implementation of safe systems of work in our workplaces. Records of training will be kept by McNab HR Department.

McNab has a requirement that concrete placement booms must not overarch scaffold stairs, primary access ways, amenity sheds or “planned work” being done by other trades. If this is not possible, these areas should be excluded during pumping.

PRIOR PLANNING

At project planning strong consideration must be given to the location of scaffold access stairs, emergency egress paths, lunch rooms and amenities and the interactions with concrete pumps.

- The Project Risk Register Workshop is the ideal planning tool for identifying and controlling such risks for the project before they happen.
- Planning must involve members of the site team (including support from HSE Coordinators).
- Alternative arrangements for concrete placement may be the solution to avoid unnecessary overhead interactions between placement booms and amenities, stairs and access/egress ways (i.e.: satellite pumps, fixed solid line with flexible hoses at delivery end).

WORKERS UNDER PLACEMENT BOOMS

Where concrete placement booms are operating workers, other than line hands or concreters, must not undertake planned work underneath the placement boom, for example form workers or steel fixers on another sections of deck.

- This restriction does not include intermittent access/egress use of perimeter scaffold
- If there is emergency work to be undertaken that will require multiple workers or an extended period to rectify then the placement boom will need to be relocated or cease operation.
- Check that trades are not working directly under the placement boom. Particular attention is needed if the boom moves across the site during the pour. Adjust the available work areas.

The line hand must not place the delivery hose over any part of their body to extend it out to reach to areas outside the delivery area but simply be there to direct the delivery hose position to the pump operator. The pictures below show the correct delivery hose handling technique [*Concrete Pumping Code of Practice 2019*].



Persons not involved in the concrete pour should be excluded from the delivery hose area.

The set-up and operation of mobile concrete pumps is critical to the safety of workers on our projects and the public. Reference 'Concrete Pumping Code of Practice 2019'

Project planning must take into account (utilise the pumping contractor to assist – consultation):

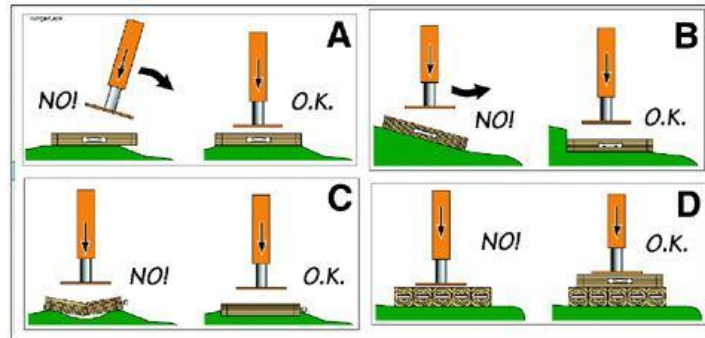
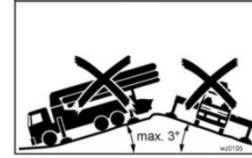
- pump selection (size, type – i.e. line, mobile boom or static)
- pump is located in the most favourable position to pump concrete;
- route for concrete lines (solid and rubber);
- overhead services;
- underground services;
- ground conditions (geotechnical);
- adequate space is available to carry out the works safely;
- pedestrian/traffic management for pump setup and concrete delivery (consider internal and external to the site);
- public protection;
- Dedicated person in charge of reversing vehicles onto the pump;
- Wash out (onsite, offsite);
- Realistic time schedule for major pours;
- An allowance is included for such things as weather, accessibility, volume of concrete, slab and site limitations, equipment back-up, restricted work times, equipment capacity, pump operator's capacity, line hand limitations and the concrete supplier's requirements; and
- A method to collect concrete residue and/or all necessary precautions to prevent wash down residue from the clean-up of pumping operations finding its way into stormwater drains; and
- Any ancillary items required (i.e. vertical pouring platforms for columns).



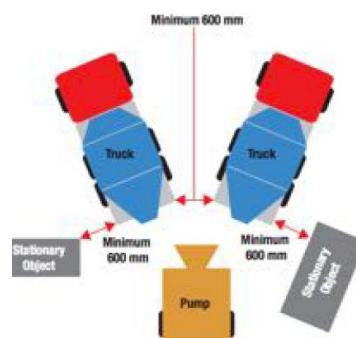
There are numerous risks associated with the setting up of concrete placing equipment, including concrete pumping booms tipping over, due to ground stability, inclination and short legging.

ITEMS TO NOTE:

- The maximum inclination of the concrete boom is 3 degrees;
- Positioning outriggers:
 - o Supply adequate sole plates for the purpose of packing the base plate;
 - o Ensure the outrigger's pads are clear of excavations, soft or filled ground, or other obstacles liable to interfere with the safe operation of the machine;
 - o Ensure that the sole plate material, if timber, is 'pigstyed' and is of sufficient bearing area to support the machine;
 - o Ensure the outriggers do not subside, by making regular checks to ensure stability.



- Wherever possible outriggers should be fully extended and short-legging should only be performed in accordance to the manufacturer's specifications. *This must be verified from the operator's manual, no verification means no short-legging.*
- Exclusion zones must be established around placement booms to prevent unauthorised access to pump from other workers and plant. Signage must be in place clearly stating that area is only for authorised persons. "Danger-Concrete Pumping Area – Authorised person only."
- Sufficient clear space around the pump and delivery vehicles, a minimum of 600mm between trucks and stationary objects.
- Concrete delivery trucks must not reverse into the exclusion zone unless they can see the nominated person for directing the truck (spotter).
- All concrete delivery trucks must be fitted with an audible reverse alarm and flashing hazard lights.



Reference: 'Concrete Pumping Code of Practice 2019'

If a site is known to have hazardous contaminants present, prior to taking management control of the site, McNab must request a copy of any geotechnical reports/Hazardous materials reports/Management plans and copies of any contaminants registers from the Owner/Occupier, if it has not already been provided. Where the extent of contamination or accuracy of the provided data is unknown, a hazardous substance survey is to be undertaken by an Occupational Hygienist and is to include but not be limited to:

- An assessment of any potentially or known contaminated soil;
- The presence of any material containing or suspected of containing asbestos;
- Electrical equipment containing or suspected of containing Polychlorinated Biphenyls (PCBs);
- An assessment of surfaces that are known to contain or suspected of containing lead paint; and
- An assessment of the presence of mineral wool/fibres (e.g. Rockwool).

Note: Where the client provides McNab with an existing hazardous substance survey report and/or register, McNab are to review the report, preferably in conjunction with the originator of the report/register or other competent person, in order to assess and determine the reliability of the information contained therein. The review shall determine the need to undertake further investigation to either confirm the presence of hazardous materials identified in the report or to investigate locations/areas not covered within the report/register provided.

WHAT TO DO IF CONTAMINATES ARE PRESENT

Where the hazardous substance survey identifies the presence of hazardous materials/substances processes on how the material is to be removed and/or treated or otherwise safeguarded (where not being disturbed) are to be developed and are to include:

- regulatory requirements necessary to safeguard persons against risk to their health and safety including those involved in the removal or treatment or who may be affected by the removal/ treatment;
- any requirements for atmospheric monitoring and health monitoring

ON COMPLETION OF REMOVAL OR TREATMENT

On completion of the removal or treatment of any hazardous material, a clearance certificate must be obtained from a competent person (an Occupational Hygienist) to verify safe removal or treatment has been completed.

DISCOVERY DURING WORKS

If any suspected hazardous contaminants are discovered during works,

- The area of concern is to be isolated from all workers and / or members of the public.
- Contact an Occupational Hygienist to take samples of material for testing.

If material sample is positive, the material must be removed and disposed of by an appropriately licenced removalist.

RECORDS

The Project Manager is to ensure the relevant subcontractor provides McNab with the following information:

- copies of all receipts for the removal and disposal of the hazardous materials;
- clearance certificates declaring the extent of removal of hazardous materials;
- copies of all monitoring results;
- notifications made to any statutory authority

The Project Manager shall ensure records are maintained of all contaminated soil/in-situ hazardous material or imported fill used or present on site to enable future traceability should future HSE issues arise. In most cases as built drawings, specifications etc. provide sufficient traceability but if this is not achievable a documented process for tracing imported fill will be implemented.

For information on asbestos, please refer to *Hazard Control Sheet 002 Asbestos*.

Reference: 'Demolition Work Code of Practice 2021', 'How to Manage and Control Asbestos in the Workplace Code of Practice 2021'.

GENERAL REQUIREMENTS

Photocopies of electrical qualifications and licences and LV (Low voltage rescue training) for those carrying out work on electrical equipment or installations are to be attached to the employee's site induction record.

Low voltage rescue training and LV rescue kit are required for any electrical work where a worker is exposed to live electrical parts or works on energised electrical equipment. This also includes some forms of testing.

Low voltage rescue kits need to be inspected and tested before use and as per the manufacturer's requirements. Inspection and testing should be completed on any rubber mats before use and as per the manufacturer's requirements.

Prior to McNab allowing the use of any energised electrical installation a Certificate of Compliance stating the electrical services have been installed, inspected, tested and commissioned in accordance with the electrical safety office requirements and **AS 3012 Electrical Installations-Construction and Demolition Sites**, is to be obtained from the relevant electrical services installer for the installed electrical services and equipment including, but not limited to:

- Installation of main switchboard (including the use of existing);
- Installation of temporary distribution boards (**Temporary power board checklist inspection must be completed on Procore for each board**);
- Supply of power to any site office, lunch/change room, ablution blocks, containers or storage areas;
- Installation of temporary lighting, including any emergency battery back-up lighting;
- Supply of power to any hoist (personnel and/or personnel & materials);
- Supply of power for a tower crane.

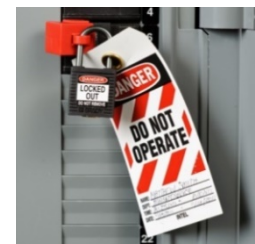
All electrical equipment is to be recorded on an electrical equipment register.



The form is titled 'Electrical AS3012 Sign-off' and includes a table for recording work. The table has columns for 'Date', 'Scope of work eg what was connected or modified or repaired', 'Electrician', 'Licence Number', and 'Signature'. There are 10 rows for data entry.

LOCK OUT / TAG OUT (LOTO)

- A Lock-out / tag-out (LOTO) procedure is to be obtained from the electrical contractor for the works and must be referenced in the relevant Safe Work Method Statement (SWMS);
- The procedure must reflect the need to ensure lock-out ('Engineering') control is used as the primary control, in conjunction with tag-out ('Administrative') controls, and is to include:
 - Isolated circuits to be locked out with personal danger tags;
 - Personal danger tags to be installed and removed by the same worker only, do not remove other workers danger tags;
 - Circuits are not to be isolated with zip ties, copper wire or similar tags that can be easily removed.



Reference: 'Electrical safety code of practice 2020 - Managing electrical risks in the workplace code of practice 2021', 'Australian Standard 3012 – Electrical Installations – Construction and Demolition sites'

GENERAL

- Access lighting is necessary for workers to be able to move around the workplace in a safe manner. 40 lux is the minimum requirement for all walkways, stairs and access areas. Calibrated Lux meters are available from McNab's Plant & Equipment department.
- A value of 160 lux is the requirement for work areas.
- Lamps in luminaires must be protected against mechanical damage (Wire cage, protective plastic cover, etc.).
- Temporary wiring supplying lighting circuits shall be connected to a designated lighting circuits on the switchboard/distribution. Permanent wiring used as temporary must be clearly identified as construction wiring, with Yellow tags installed identifying use as construction wiring, where visible, and at intervals not exceeding 5m.
- Lighting circuits must be protected by a RCD or ELCB.
- Lighting cannot be sensor operated – must be permanently on during work hours

EMERGENCY LIGHTING

- To allow for safe access and egress sufficient emergency lighting with battery backup must be installed in stairways, corridors and directly above, and in front of, switchboards, if there is insufficient natural lighting.
- Lift shafts - Emergency lighting positioned so that personnel can exit at each egress point from the lift shaft.
- Emergency lighting must be hard wired in, or have connections/couplers prevent unauthorized disconnection.
- Emergency lighting must be at a minimum of 20 Lux at 900mm height along centre line of corridor or otherwise documented to meet requirements of **AS 2293.1 - 2.7.3 Emergency lighting**.
- Emergency lighting run down test must be completed by the electrical contractor and a copy retained and available onsite. This ensures emergency lighting will provide a minimum 20 lux for 60 minutes in the event that power is cut.
- Illuminated emergency evacuation signage (battery back-up) must be capable of illuminating the exit signage and provide clear directions for safe egress of the workplace in the event of power failure. These must be tested and results recorded by the electrician.
- Emergency direction signage that is not illuminated must be no more than 1.5m from emergency lighting (providing 200 lux at face of the sign) and provide clear directions for safe exit from the workplace.

TASK LIGHTING



- A mechanical guard is to be fitted to task lighting in order to protect the lamp.
- Task lighting shall be of an adequate stability.
- LED lighting is preferred over halogen type bulbs.
- Selected and positioned to reduce glare and not impair vision of workers
- Subcontractor supplied and maintained.

LIFT SHAFTS

- Lighting level equivalent to 36W fluorescent and guarded against mechanical damage
- Connected to supply via plug and socket arrangement
- Installed at intervals not exceeding 6m with the uppermost fixture installed within 1m of top of lift shaft.
- Where shaft contains more than 1 lift, illumination must be sufficient for adjacent lift/s.

References: **AS/NZ 3012 Electrical installation-Construction and demolition sites** and **AS/NZ 2293 Emergency escape lighting and exit signs for buildings**

Temporary electrical boards (switch/distribution boards) are to meet the following requirements:

- Installed in accordance with AS/NZ 3000.
- Installed in a manner and location so as to prevent tip-over or movement (e.g. secured to a wall, post or free-standing structure) and the enclosure to have an appropriate degree of protection for the environment in which it is installed, subject to a minimum degree of protection of IP33 for outdoor areas.
- As a general rule must not have any spaces or gaps allowing access to wiring and provide protection from water falling or spray.
- Include an insulated device to prevent strain or termination of cables and flexible cords (e.g. tie-bar).
- A means of supporting flexible cables off the floor e.g. cross arm.
- Protected from weather extremes.
- Be designed to ensure all main switches are accessible at all times.
- Each switchboard must be provided with one marked isolating switch which, if switched off, will interrupt supply to all final sub-circuits and sub-mains originating from the switchboard, including socket outlets mounted on the switchboard.
- The switchboard must be provided with a means to prevent electrical equipment from being inadvertently energised while undertaking work on electrical installations (provision for fitting a padlock or located within a lockable space or enclosure).
- Main switchboard isolating switches must be marked 'MAIN SWITCH' and the distribution board isolating switches must be marked 'DISTRIBUTION BOARD ISOLATING SWITCH'.
- Have markings at least 6mm high, in a clear and legible manner, identifying all mains/isolating switches;
- Sign on door stating: 'KEEP CLOSED, RUN LEADS THROUGH BOTTOM'.
- Fixed doors or lids so that they:
 - o are kept closed except for access
 - o need a tool for removal
 - o are lockable
 - o can be positively held open
- Live parts protected to prevent contact by anyone connecting or disconnecting plugs and appliances (Pole fillers provided).
- Area in front of switchboards are to be kept clear at all times (1.2m minimum clearance).
- Switchboards must be marked with an electric shock symbol and a danger sign (as per below) warning workers of the presence of energised or live parts within the switchboard.



- Identification of who to contact, contact number and where identification/location of where the board is fed from.
- Clearly identify extra switches for:
 - o Final sub-circuits intended to operator after hours;
 - o Emergency systems
- Supply cable (construction wiring) must be protected from mechanical damage (conduit or steel armoured) and marked with yellow iridescent tape stating construction wiring at no more than 5m intervals.
- Emergency lighting (with battery backup) must be installed above and in front of switchboard (where there is insufficient natural light)
- Lift shaft equipment shall consist of a separate protected sub circuit and circuit breakers shall be locked and tagged to prevent isolation to the supply to the lift shaft by others onsite.

Note: In the event of an RCD or circuit-breaker operating, the cause of any fault should be assessed by a licensed electrician before resetting. As such the RCDs within the Switch / Distribution Board should be inaccessible to everyone except the site electrician.

Reference: 'Australian Standard 3000 – Wiring Rules', 'Australian Standard 3012 – Electrical Installations – Construction and Demolition sites'

Installations must only be undertaken by a licensed electrical contractor, registered in the state for the type of electrical works being performed, and holding current competencies in low voltage rescue and CPR.

Temporary construction wiring is to be installed to meet the following requirements:

- Installed in accordance with AS/NZ 3000, AS3012 and also AS/NZS2802 for trailing cables used for surface wiring.
- Shall not be tied, bundled or grouped with permanent wiring.
- Shall not be attached to free standing fencing.
- Not mounted directly to temporary structures e.g. formwork/scaffolding - Catenary lines to be used in these cases.
- Cables supported by catenary lines must be double insulated or equivalent and positioned to avoid crossing access ways where high plant or loads travel. Where it is not possible to avoid, flagged catenary wires or cables are to be positioned 6m both sides and 0.6m below the lowest point.
- Shall not be positioned where it creates a trip hazard or otherwise be a hazard to workers or plant.
- All electrical circuits, including mobile generator sources, must be protected by an Earth Leakage Circuit Breaker (ELCB), Residual Current Device (RCD) or a Ground Fault Circuit Interrupter (GFCI), fitted at the source.
- Must be clearly be identified as construction wiring, by using cable sheaths of a different colour or by attaching iridescent yellow tape identifying as construction wiring, where visible, and at intervals not exceeding 5m.
- Permanent wiring used as temporary must clearly be identified as construction wiring, with Yellow tags installed identifying use as construction wiring, where visible, and at intervals not exceeding 5m. (Live permanent wiring shall be readily distinguishable from construction wiring and unidentified wiring is deemed to be live until tested and proven otherwise.)



Protection - Construction wiring must be able to operate safely and function properly in the conditions to which they are likely to be exposed to, and not be subject to mechanical damage, damage by liquids, or damage by high temperatures.

- Where there is a risk of mechanical damage to cables (including earth cables and stakes), they shall be protected by a suitable enclosure or barrier not less effective than - Medium or heavy duty rigid or corrugated insulating conduit, Flexible electrical hose, Armoured cable, or other means that provide equivalent protection. Where suitable protection cannot be provided a risk assessment should be undertaken.
- Where a wiring system is, or may be, exposed to direct sunlight, a wiring system suitable for the conditions must be selected and used, or adequate shielding must be installed.
- As a rule mechanical protection must be provided, including, but not limited to, the following:
 - o Cabling up to 2.5m from floor/ground
 - o Installed on metallic roofs or edges, transportable structures, containers or similar
 - o Within 150mm of scaffolding
 - o On formwork decks
 - o Slung under slab more than 150mm away from juncture and wall or beam that would otherwise provide protection.
 - o Installed within 150mm of unearthed metal structures (sheet metal ducts, hydraulic piping, reinforcement steel, etc.
 - o Installed in adverse environments
- Always refer to AS/NZS3000 Wiring Rules – 3.3 External Influences, for further protection details.

All construction wiring, including switchboards, fixed RCD's and transportable structures, shall be inspected and tested by a qualified licensed electrical contractor to verify they are in accordance with AS/NZS3000 following the installation. Documented certificate of electrical safety is to be provided by the electrical contractor to demonstrate the electrical installation meets AS 3000 and AS 3012 – a copy to be available and retained onsite.

Where the visual inspection identifies damage or non-compliance to electrical standards, that part of the installation must be isolated, repaired or replaced, and tested as required.



Reference: 'Australian Standard 3012 – Electrical Installations – Construction and Demolition sites'

These tools can be very dangerous due to the extreme force they create when activated, the danger created when they misfire, or a projectile penetrates the intended surface.



THE BASICS:

- Operator to be competent/ trained (CPCCCM2007A - Use explosive power tools)
- Keep tool securely stored when not in use
- Store charges separately and not with the tool
- Loaded tools must not be left unattended. An unloaded tool must not be left unattended in a place where it would be accessible to unauthorized persons
- Neither loaded nor empty tools are to be pointed at any person

PRIOR TO USE:

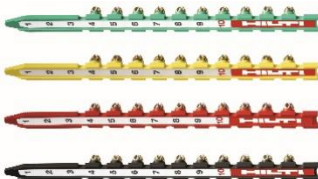
- Install appropriate warning signs and exclusion zones around work zone in area of tool use and areas adjacent to tool use (behind walls being fired into or floors below if the backing material can not sufficiently stop an overpowered charge)
- Fasteners shall not be driven through existing holes unless a positive guide is used to secure accurate alignment
- No fastener shall be driven into a spalled area caused by an unsatisfactory fastening

OPERATING:

- Tools must not be loaded until just prior to the intended firing time
- Keep hands clear of the barrel end
- In case of a misfire, the operator must hold the tool in the operating position for at least 30 seconds; then try to operate the tool a second time. If the misfire occurs again, the operator must hold the tool in the operating position for another 30 seconds; then proceed to remove the explosive load in strict accordance with the manufacturer's instructions
- Tool is to be 90 degrees to the material to be fastened
- Fasteners must not be driven into some materials including, but not limited to, cast iron, glazed tile, surface-hardened steel, glass block, live rock, face brick, or hollow tile

BASIC CHARGE IDENTIFICATION

Each manufacturer has different charge types, contact the manufacturer if you are unsure on what colour charge should be used for the application.



Hilti Strip Charges



Ramset Power Loads

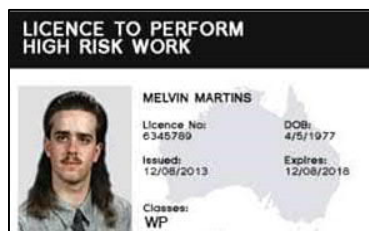


Ramset Disc Feed

Before Elevated work platforms (EWP) are used onsite, you must ensure that workers who are to use the EWP have been provided with information, training, instruction and supervision that is necessary to protect them and others from risks arising from the use of the type of EWP – Boom type or Scissor lift, and that the ground conditions and work areas are sufficient for the EWP to be operated safely.

COMPETENCIES REQUIRED

To operate a boom type EWP over 11m – the operator must be trained in TLILIC0005 - Licence to operate a boom-type elevating work platform 11 metres or more by an RTO, Have applied and Hold a current High Risk Work License (HRWL) for WP.



Note: holding a HRWL WP does not mean the holder is trained or competent to operate a scissor lift EWP.

To operate a boom type EWP under 11m or a Scissor Lift – a Certificate of competency to operate Elevating Work Platform from a RTO - the specifying the type of elevated work platform the competency has been issued for – EWP and/or Scissor lift.



“Yellow Cards” are issued by an industry body outside of the Vocational Education Training (VET) system. You do not require a Yellow Card to operate a EWP or scissor lift. However they do demonstrate training and competence in the operation of the plant.

Trailer Mounted EWPs' (Cherry Pickers) are not allowed to be used on any McNab project.

Elevated Work Platforms (Scissor Lifts) are not to be moved whilst elevated unless a documented Risk Assessment has been undertaken with all associated site specific hazards identified and controls implemented.

Always remember to elevate the platform to prevent access and remove the keys when not in use or at the end of each day.

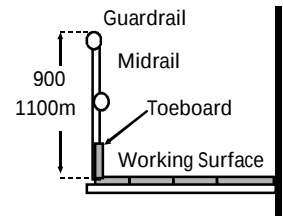
Reference: 'Managing Risks of Plant in the Workplace Code of Practice 2021', 'How to Manage Work Health and Safety Risks Code of Practice 2021'

HAZARD CONTROL FOR EDGE PROTECTION & FALLING OBJECTS

There is a significant risk of dropped objects when performing work or using tools and portable equipment at height, including, but not limited to working from balconies, roofs, working platforms (WP/EWP/scaffolding), within excavations and from formwork.

EDGE PROTECTION

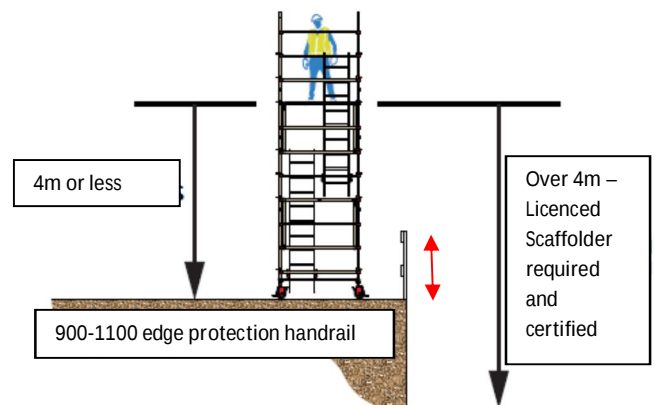
Hand railed edge protection, as a minimum, needs to be installed to prevent falls from heights. These must incorporate a top rail (900mm to 1100 mm) above the working surface and have a mid-rail and a toe board or be fully enclosed. Where there remains a risk of objects or workers able to fall over the guard railing, full height screens, perimeter scaffolding and other controls must be determined and implemented. These should have either 25mm square mesh or alternatively 50mm square mesh with shade cloth installed to prevent objects from falling through between rails.



It is not safe to use a platform ladder, work platform or safety step to gain extra height near the edge of an open floor, penetration or besides any railing, as you may be able to fall over the guardrail. Safety Steps and platform ladders are not to be used in these situations. Mobile scaffold or hand railed work platforms or travel restraint should be used to prevent the worker from reaching or falling from an unprotected edge.



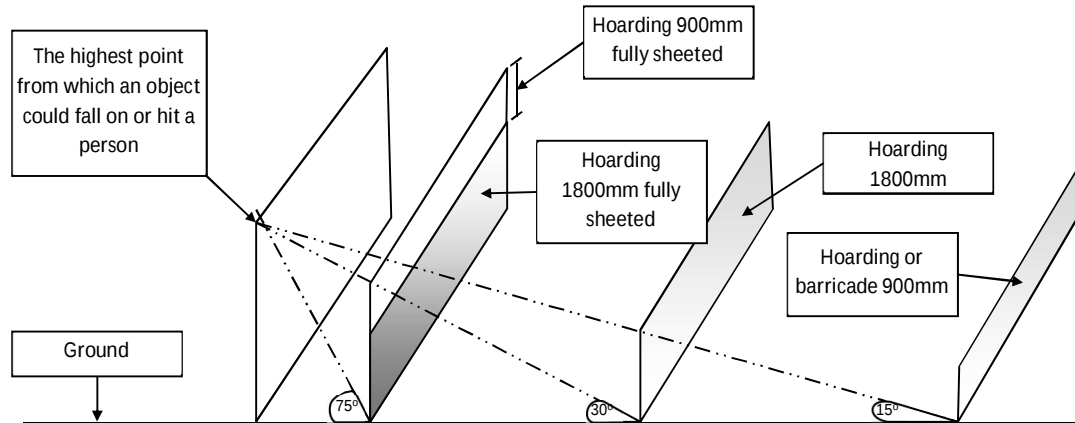
Any scaffold from which a person or object could fall more than four metres must be erected, altered and dismantled by a licensed scaffolder. This includes, mobile scaffold such as zippy scaff or similar. Edge protection (hand rails, mid-rails and toe boards) must be provided at every open edge of a scaffold work platform.



SITE FENCING AND HOARDING

Building fencing and hoarding requirements calculator can be used to assist in determining the fencing or hoarding requirements for sites. The fencing/hoarding requirements must be determined by measuring the angle to the horizontal formed by a straight line between the highest point from which an object could fall on or hit a person; and the point on the ground that is closest to the highest point. Where the following angles are identified, their respective hoarding is to be established.

1. Less than 15° - a barricade or hoarding at least 900mm high that surrounds the structure is erected along the proposed line
2. More Than 15° but less than 30° - a hoarding at least 1,800mm high is erected along the proposed line
3. More than 30° but less than 75° - a hoarding at least 1,800mm high that is fully sheeted with timber, plywood, metal or sturdy synthetic sheets and that is not part of a gantry is erected along the proposed line or a gantry is erected
4. More than 75° - Erect a gantry, Close the adjoining area (Temporary barriers and traffic control must be utilised to maintain these zones during works), erect a catch platform with vertical sheeting or perimeter screening.



OVERHEAD PROTECTIVE STRUCTURES

Where scaffold catch deck or pedestrian gantries are to be used, they shall be designed and certified by a structural engineer and load/impact rated (not more than 10m above the ground = 5kPa more than 10m above the ground = 10kPa) so that a falling object or load (within determined limits) should not penetrate and is prevented from falling. Underneath these areas shall be well lit, prevent dust, debris and water from falling through and can be safely accessed at all times, with the exemption for when a load exceeding the determined rating passes overhead.

Careful consideration will also be taken for vehicular/plant impact. A gantry shall be designed so that it will not collapse when subject to significant force from a vehicle. Any columns adjacent to a carriageway must satisfy vehicle impact requirements of AS 1170. Where possible, gantry columns will be set back a minimum of 750mm from the kerb. Continuous concrete barriers or bollards will also be installed in front of the structure.

DROPPING OBJECTS

The following provides guidance for the safe use of tools and portable equipment at height. "At height" tools must be used for all tasks undertaken where there is the potential for tools to drop more than 2 metres, e.g. when working at or near a balcony edge.

Tools and portable equipment (including PPE) used at height must be adequately secured to either the user or the structure via a load rated lanyard/tether and attached where it does not compromise the tool or equipment's safe use. All tools, lanyards and attachment points must be inspected by the user prior to use to ensure they are fit for purpose.

If any tool or equipment is dropped, or if the retention system failed such that there was potential for the tool or equipment to drop, it must be reported immediately

A dropped object calculator can assist in determining the potential consequences of dropped objects.



EXCLUSION ZONES WITHIN SITE BOUNDARIES

For all work at heights, an exclusion zone must be established by the responsible contractor in consultation with the respective McNab Area Foreman and must be barricaded and signposted (spotter/s may also be required) prior to and during the work at height commencing. As with all works, all established excluded areas are to be implemented and maintained in a way so that in an emergency the works must cease, and the egress routes are able to be opened and not impede for emergency egress.

Other control measures to minimise falling objects include - good housekeeping and securing loose materials.

Reference: 'Work Health and Safety Regulation 2011 – Part 3.2 Division 10 and Part 6.4 Division 3'

ACCESS AND EGRESS

Clear access is important for the safe movement of materials, equipment and persons on site.

Designated access ways must be provided and clearly recognisable, especially under formwork decks.

Emergency access and egress must be considered and provided to all parts of the workplace where persons are required to work (slip form, jump form).

Two forms of emergency access and egress must be maintained at all times.

	Emergency access and egress solutions required	Additional emergency access and egress solutions required
1	Man and material hoist	Stretcher stair and single scaffold stair
2	Crane only	Stretcher stair and single scaffold stair
3	Man and Material Hoist and crane	Stretcher stair and single scaffold stair
4	No crane or man and materials hoist	Two stretcher stairs are to be provided for emergency access

Stairs are to be used as the primary form of access and egress to and from a formwork zone unless it is not reasonably practicable to do so. Temporary timber stairs to a maximum height of 1.5m may be constructed by a competent tradesperson to gain access from scaffold platforms to adjacent form work decks. Refer to Section 4.5 of the Formwork Code of Practice 2016 for further information.

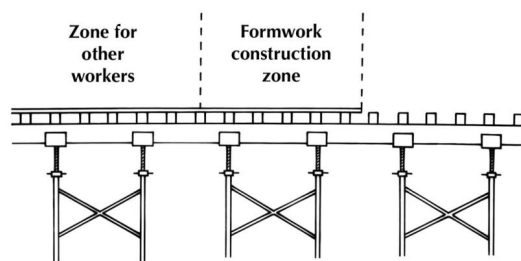
LIGHTING See hazard control sheet 008 Electrical - Lighting for further information.

HANDOVER FOR OTHER TRADES

Consultation between form worker and other trades should take place to ensure a suitable handover of the completed elements of the formwork deck is provided and a 'competent person' (formwork contractor) on site must signoff that the following has been completed before other trades access the deck:

- penetrations are covered;
- handrails are installed;
- water and power are ready for installation; and
- there is a stair system (proprietary or permanent) provided for safe access and egress to the working deck.

The formwork zone must be sufficiently large to ensure that these other persons are clearly separated from form workers. A 'formwork only' zone should be maintained behind the leading edge. This zone should be clearly demarcated by signage and flagging.



CONCRETE BEAMS IN SLABS

Where we have any concrete beams over 350mm deep from finished floor level to the bottom of the beam or decks over 350mm where mesh size is greater than 200mm x 200mm it needs to be meshed out prior to the pouring of the concrete slab. This will assist in eliminating the risk of a worker falling into the beam or deck when concrete is being placed. Safety mesh should not be more than 200mm x 200mm.

A hazardous manual task means a task that requires a person to lift, lower, push, pull, carry or otherwise move, hold or restrain anything involving one or more of the following:

- repetitive or sustained force
- high or sudden force
- repetitive movement
- sustained or awkward posture
- exposure to vibration

These factors (known as characteristics of a hazardous manual task) directly stress the body and can lead to serious injury known as musculoskeletal disorder (MSD).

PLANNING FOR HANDLING LOADS

Prior planning to eliminate or minimise the risk of hazardous manual tasks must occur. Ensure manual handling techniques and controls are mentioned in the SWMS.

Examples of control measures that should be considered when planning for loads include:

- purchasing products in smaller loads for manual handling or larger loads to be shifted mechanically;
- reducing the size or capacity of containers;
- Changing the design or layout of work areas and system of work.
- using handheld hooks or suction pads to move loads such as sheet materials;
- using grip devices adapted to the particular object to be carried; and
- mechanical devices and aids to materials handling should be readily available
 - o lift tables, lift trolleys, two-wheel hand trucks, pallet trolleys and
 - o glass panel, duct and plaster lifters.

MANUAL HANDLING - REQUIREMENTS

Manual handling is still required to be performed by workers, and to this end, correct manual handling should be topics at inductions and Toolbox Talks:

- Gloves are mandatory for all construction activities;
- When possible, use mechanical equipment;
- When lifting, face the load, keep back straight and lift with the legs, not the back, keeping the load close to the body;
- If load is too heavy, get help;
- When group (team) lifting, nominate someone to direct the lift;
- Ensure the area is clear of obstructions;
- When lifting over-head, don't over-reach;
- Avoid repetitive bending and twisting;
- Rotate tasks;
- Tool is appropriate to the task.

CONCRETE SCABBLING/JACKHAMMERING

The following is a requirement when concrete scabbling / jackhammering:

- Rotate the work between workers. No more than two consecutive days concrete scabbling or jackhammering for any work – 2 days on scabbling work, 2 days off scabbling work;
- Regular recorded rest breaks – 20 mins on, 20 mins off;
- Scabbling/jackhammering tools must be the anti-vibration type;
- A combination of pole hand scabblers and hand scabblers. The pole scabblers eliminate the need to be in a crouched or bent position;
- Correct size jackhammer to suit the work being undertaken; and
- Correct PPE for the tasks including the use of anti-vibration gloves.

Reference: 'Hazardous Manual Tasks Code of Practice 2021'

Ladders are not to be used in place of scaffold.

PLATFORM LADDERS

Platform ladders or Work Platforms must be used when undertaking stationary work at height. Platform ladders over 2 m in height must have edge protection.

Where a platform ladder is to be used the following are to apply:

- Platform Ladders are to be of industrial grade (120kg or greater), in good condition (including having a legible rating stickers) and meet the applicable Australian Standard;
- A safe work method statement is to be developed for the use of the platform ladder in consultation with the personnel required to work from the platform ladder where there is a risk of fall from height 2m or greater.
- Platform ladders are to be of a suitable height for the work it is used for;
- Platform ladders **MUST NOT** be used within one and a half times the height of the ladder work platform from edge protection guarding (i.e. guarding to prevent a person falling more than 2 metres);
- Platform ladders **MUST NOT** be used on stairs (including landings);



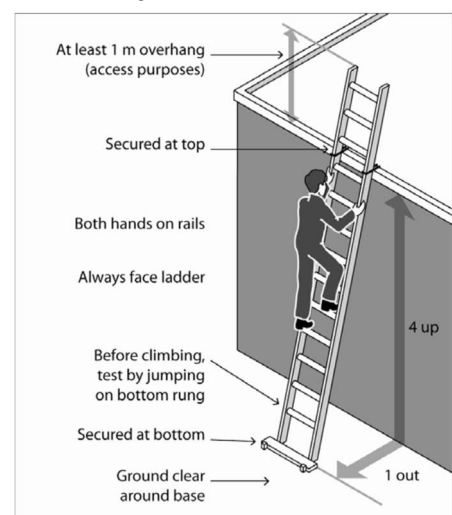
Platform Ladder



Work Platform (hand railed)

ACCESS

- Single/extension ladders may be used for access/egress only. When used ladders must be firmly tied off at the top. Remove these ladders when access is no longer needed. Single ladders must be no longer than 6.1m and extension ladders not more than 7.5m.
- Where ladders are used for access, they are to extend a minimum of one (1) metre above the areas being served.
- Maintain 3 points of contact.
- Always face the ladder when ascending or descending.



Reference: 'Work Health and Safety Regulations 2011, Part 6.3 Subdivision 3' and 'Managing the risk of falls at Workplaces Code of Practice 2021'

A person is not required to hold a scaffolding licence to erect mobile scaffolding where a person may fall less than 4m. However, any person carrying out scaffolding work should be competent to erect, dismantle, maintain and alter the scaffold. Competence is acquired, through training, qualifications, experience or a combination of these, the knowledge and skill enabling the person to undertake the work.

Mobile scaffold must be erected and have all its components fitted in accordance with the manufacturers design. Proprietary designed Mobile scaffold is to have RPEQ design documentation. Always ensure suppliers provide this information with the components, this may be in the form of:

- Certification with documented assembly instructions; or
- A sticker fixed to the scaffold components identifying its certification and how it may be assembled.

Assembly Procedure



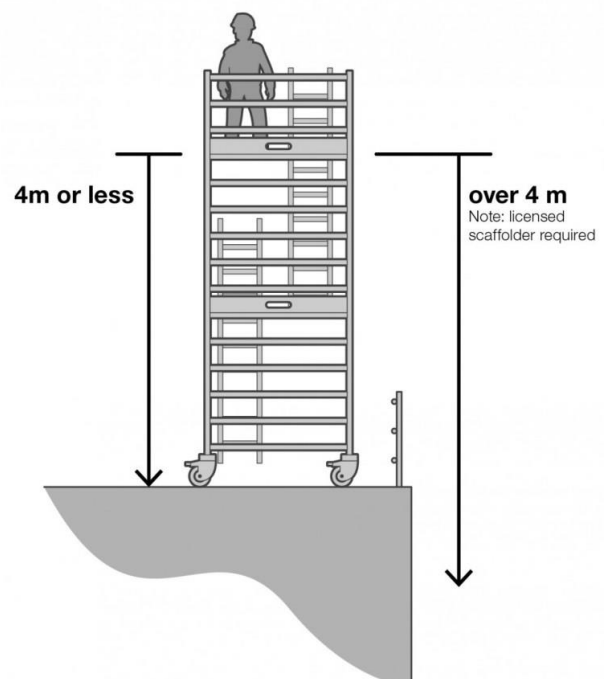
- Safe means of access to the scaffold is to be provided to the working platform, e.g. internal ladder access and hinged work platform hatch. Hatch is to remain closed when persons are working from work platform and secured closed when not in use.
- Edge protection (hand rails, mid-rails and toe boards) must be provided at every open edge of a scaffold work platform above 1m in height.
- The overall height of the scaffold must not exceed 3 times the width of the scaffold, unless ties or outriggers are installed or unless specified otherwise by the manufacturer.
- McNab Plant and Calibration inspection is to be completed on all assembled mobile scaffold prior to use, and any shortfalls must be rectified prior to an Authorised Plant sticker being placed authorising its use.
- Mobile scaffolds are never to be moved whilst anyone is on the scaffold.
- Wheel locks are to be fully engaged at all times whilst persons are working from the scaffold.

Where there is a risk of falling over 4m

Mobile scaffolds with a working platform/deck height, where there is a risk of falling over 4 metres must be erected, altered and dismantled only by a licenced scaffolder. This includes, mobile scaffold or similar proprietary systems. In these circumstances Handover certification from the licenced scaffolder is also required and the scaffold must display Scaff-tag (or similar, identifying its status).

Avoid using mobile scaffolds where there is a risk of a person falling greater than 4m, an alternative system should be considered, (i.e.: EWP or a fixed scaffold).

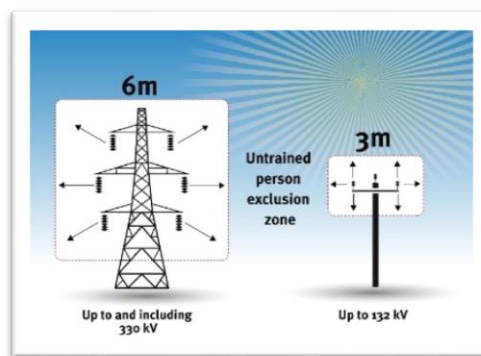
Reference: 'Scaffolding Code of Practice 2021'



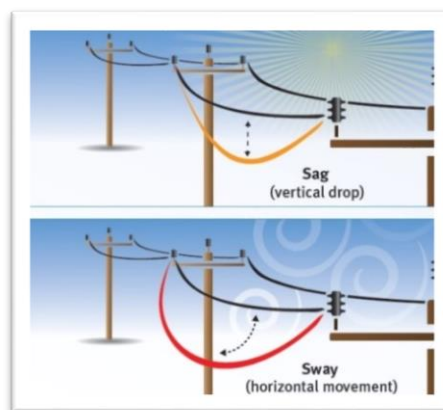
Where any work is to be undertaken in the vicinity of overhead power lines (including any rail or tram overhead power lines) relevant information/instruction must be obtained to allow the works to be carried out in a safe manner and may include but not be limited to the following:

- Contact the Asset Owner to determine the voltage of the service(s), attain any information in relation to the height of the overhead power lines and if applicable the specific minimum safety clearance requirements;
- Where at all possible de-energise the overhead power line(s) where there is a potential for inadvertent encroachment of the “Untrained Person ¹Zone”
- Obtain approval from the Network Operator to determine areas where there is potential to inadvertently encroach the “No-touch Zones”, or work is undertaken above an overhead power line;
- Ensure that when required a dedicated spotter, who is authorised by the asset owner, is utilised.

An example of an Exclusion Zone around poles



When calculating the exclusion zones around lines the sag and sway must be taken into account, don't rely on a simple 3m or 6m rule as dependant on the line it can decrease the distance to the exclusion zone edge. Consultation with the Network operator will assist in creating an accurate exclusion zone.



This is not just limited to plant operation but any activity which may encroach on the exclusion zone, (i.e. Scaffold erection/dismantle, façade painting with poles, etc.)

Overhead Power – control measures

When working inside the exclusion zone of overhead power lines ensure you comply with power provider's advice and confirm all contractors working in this zone are aware of the requirements of this advice. Measure the height of the power

¹ An untrained person, for an electric line, means a person who is not an authorised person or an instructed person for the electric line. The greatest exclusion zone distances apply to untrained persons.

lines so you can make a conscious choice on how to manage this risk e.g. deliver, store and move components. Note also that the power line will sag more under warmer weather conditions, so factor in a tolerance for this.

Where required control measures should be considered when working near and under powerlines. Utilising the Hierarchy of Controls to determine safest controls for the works onsite, in order of priority:

Elimination

The most effective control measure is to remove the risk of exposure to overhead powerlines. Working with the electricity provider early in the design phase may eliminate these hazards before work begins, providing adequate time to complete the planning and approval process. Options may include:

- De-energising the electric line during work
- Isolating and earthing the line (or equivalent for low voltage or rail) so it is not live during work
- Re-routing the electric line away from the work area
- Replacing existing overhead electric lines with underground electric cables

Substitution

Substituting the hazard or hazardous work practice with a safer one. This may include performing the work another way, for example:

- Using alternative plant which cannot enter an exclusion zone e.g. use a smaller forklift where its full height extension wont encroach into the exclusion zone
- Using non-conductive tools designed to reduce the possibility of direct contact with overhead powerlines
- Using ultrasonic measuring devices instead of the mechanical types for measuring heights of overhead lines
- Replacing uninsulated overhead lines situated near construction, with insulated overhead lines

Isolation

This measure minimises the risk by isolating or separating the live power lines from people, plant or equipment from entering the exclusion zone. Note that physical barriers need to be risk assessed as their construction may encroach the power line. Examples include a gantry to provide a physical barrier to the power line or having adjacent scaffolding fitted with ply to its perimeter to physically prevent encroachment into the exclusion zone.

Engineering controls

Engineering controls are used to minimise the risk of contact with overhead lines. For example

- Bundling of exposed/ uninsulated two, three or four cables and replacing them with one combined insulated cable (as pictured).
- Fitting plant with programmable zone limiting devices e.g. crane computer which restricts its boom extending into the power line exclusion zone



Bundled powerlines

Administrative controls

Involves the use of safe work practices to control the risk such as:

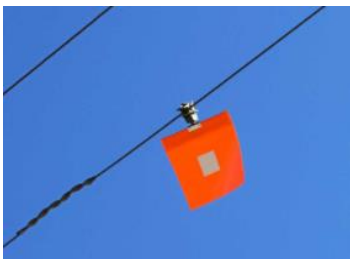
- Identify longer component deliveries at your daily supervisors meeting to better plan their;
 - Delivery location to reduce tasks/handling underneath power lines
 - If a spotter is required
 - For longer lengths only have two man lifts with no overhead lifts

Ensure all Safe Work Method Statements identify and have controls to manage work near power lines. You can verify this using your task observations in Procore.

- Establish exclusion zones – a safety envelop around an overhead powerline, no part of a worker, operating plant or vehicle should enter an exclusion zone while powerlines are energised (live) and making these visible e.g.
 - **Marker Flags** are utilised as a temporary visual marker only. They are positioned approx. every 5 meters on each powerline to improve visibility of overhead lines, for the duration of the works. Each marker has a reflective square, so the flags are visible at night.
 - Physical barriers on the ground which prevent access underneath the exclusion zone
 - Spray paint line on ground that people and equipment are not allowed to cross
 - McNab Paddy warning sign pointing up to the power line
 - Designated trained spotter
- Get an experienced authorised spotter and set expectations to ensure that they are proactive in their task i.e. not afraid to point out hazards even if not directly related to their task
- Ensure there are enough electrical spotters to adequately cover multiple trades working in the area
- Use of permits, emergency plan and rescue procedures

Note Tiger Tails/Lion Tails are **not to be confused** with marker flags. These are no longer used or installed on Energex assets, as they deem them unsafe unless the work is being undertaken by Energex trained employees.

Marker Flag



Tiger/Lion Tails



Personal Protective equipment (PPE)

This is the last line of defence and should only be used in combination with the other hierarchy of control measures listed above. These include specialist protective eyewear, rated insulated gloves, rubber soled boots, standing on a rubber insulating mat and dry clothes especially in wet or humid conditions

Reference: 'Working near Overhead and Underground Electric lines-Electrical Safety Code of Practice 2020'

SAFETY OBSERVER ¹ZONE

An item of plant is considered to be in the safety observer zone when, the position of the plant is located, it is possible that any of the following could enter the exclusion zone of live electric lines during operation:

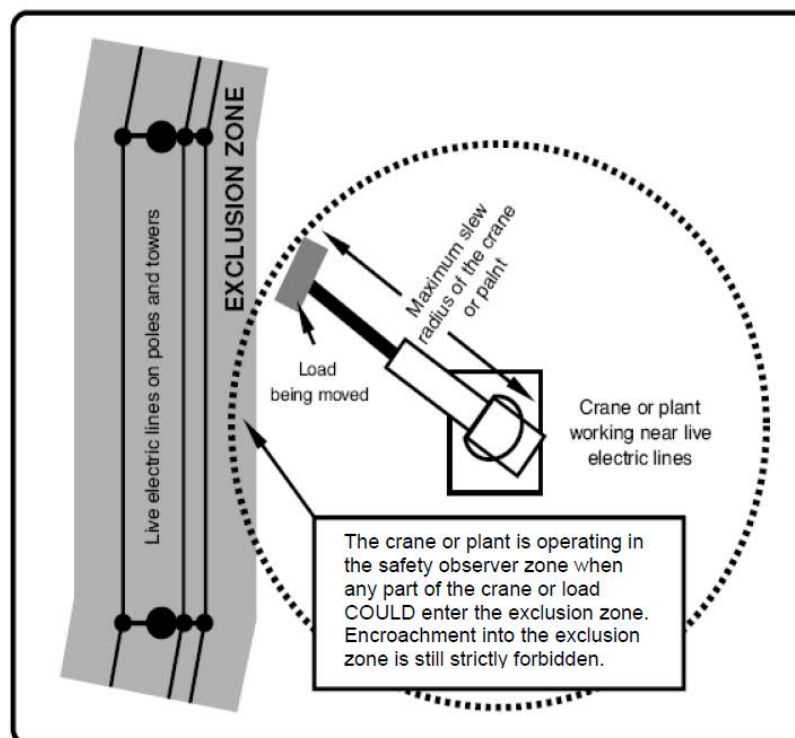
- any part of the operating plant;
- any person on or working on an EWP;
- any hand tools or other equipment held by anyone involved with the operation (including scaffold); and
- the load being moved.

Plant is not operating in a safety observer zone when:

- high voltage electric lines have been de-energised and earthed;
- limiting devices have been installed to warn the operator or prevent any part of the crane, plant or load being moved from entering the exclusion zone; or
- any part of the crane, plant or load being moved is prevented from entering the exclusion zone by physical barriers.

The safety observer zone for overhead electric lines is illustrated in Figure 1. While this figure illustrates a crane operating, the example applies to all plant.

Figure 1: Safety observer zone for overhead electric lines



Reference: 'Working near Overhead and Underground Electric lines - Electrical Safety Code of Practice 2020'

¹ A safety observer or "spotter", for the operation of operating plant, means a person who:

- observes the operating plant; and
- advises the operator of the operating plant if it is likely that the operating plant will come within an exclusion zone for the operating plant for an overhead electric line.

Typically this is a person who has undergone specific training and is competent to perform the role in observing, warning and communicating effectively with the operator of the operating plant.

Braces that are struck by mobile plant are likely to collapse in a very rapid and uncontrolled fashion and there can be a very high risk of fatalities occurring both to persons operating the plant and to other persons located in the area. A falling panel is also likely to strike other panels as a 'domino' effect can occur.

Mobile plant should generally not be operated or travel close to erected panels and braces unless there is a very good reason for the plant being there (i.e. the use of a boom lift EWP to assist in the installation or removal of braces). When a crane is being used to erect the structural steel work, controls must be implemented to prevent parts of the crane and the suspended loads coming into contact with the panels and braces.

Under no circumstances should mobile plant actually be permitted to make contact with an installed brace.

Some control measures that may be used to reduce the risk of mobile plant contacting braces or panels include:

- Use of 'para-webbing' and/or signage to make the brace position obvious, particularly where access areas are located;
- The use of a spotter to signal the plant operator to stop the plant in the event of any part of the plant approaching a brace or panel. Note: the use of a spotter may not be an effective control measure on its own, due to on site noise, delay in the plant operator acting on the spotter's signals and incorrect interpretation of the spotter signals.
- The use of plant that reduces the risk of contact with panels or braces. Two examples are:
 - o the use of mobile cranes that do not have to be located where slewing contact with a brace is possible, and
 - o the use of boom type EWPs instead of scissor lifts (note: this may not always improve the situation).



Mobile plant travelling from one area on site to another should not travel close to braces if it is possible to travel by an alternative route. Mobile plant is not, under any circumstances, to be driven under bracing.

Reference: 'Tilt-Up and Pre-Cast Construction Code of Practice 2003'

Design

- The Safety in Design process should mitigate and minimise penetrations, both in size and number.
- The preconstruction planning should detail the penetrations to be utilised in the construction methodology and confirm how each penetration will be protected.
- Risers, shafts and penetrations built into slabs are to have mesh and purpose made trafficable grills at each floor level as a minimum.
- Where practicable, penetrations should be provided with cast-in mesh when the concrete floor is poured. The mesh should be 50 millimetres x 50 millimetres or smaller and not less than 4mm thick and made from material capable of withstanding the potentially imposed load.
- Before the deck is laid, joists placed up to the edge of the penetration must be secured so that the timbers cannot spread if a person falls on them
- Structural consultants to include penetration guidelines/drawings on structural drawings.

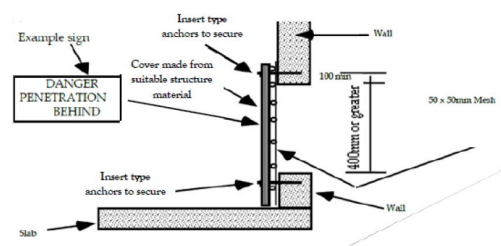
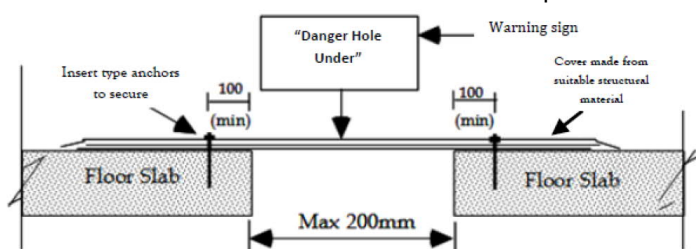
Planning

- Confirm responsibility for placement and removal of horizontal and vertical penetration protection.
- Planning of location and number of penetrations.
- Interface between stripping and the installation of protection.

Penetrations

As a minimum, management of penetrations is required to stay within these requirements; significant structural variations may need to be proofed by a certified engineer.

- Horizontal Penetration covers will be of either steel, high-density plastic or plywood as a minimum, and will be YELLOW, ORANGE or RED in colour. Signage or stencilling must be present on penetration cover stating "Danger Penetration Below".
- Penetration covers will be positively fixed, (screw fixed). NOTE: if plywood is used, it is to be in sound condition, supported adequately and fully painted (New paint each installation if required to ensure they remain highly visible) in a high visibility paint with stencil marking as well).
- Safe penetration protection must be inspected and maintained before/during/after services installation or removal of protection. Damaged protective equipment must not be used and/or replaced
- Obtain an engineer's certificate when using plant and equipment over penetrations or where risk assessment identifies it as high risk. Where plant is to be used on top of penetration protection load rating should be displayed within
- A Cutting, Coring, Chasing and Drilling Permit will be used for any penetration larger than 25mm diameter, for all wet coring and saw cutting works or where substrate may contain – electricity, gas, water or stressing tendons.
- Use approved lift cages/gates for lift shaft door openings when access is required.
- The cover should be designed for the potential loads that may be applied.
- Covers must be secured to the floor. Fixings for the cover should require the use of a tool to be removed.
- All covers must be chamfered to minimise potential slip, trip or fall hazards.
- Where holes are cut in the mesh for services to pass through, the hole should be cut to the profile of the service so that mesh remains in the penetration.



Example of a horizontal and vertical penetration covers

To determine minimum penetration protection select from the following table:

Penetrations	25mm x 25mm x 3mm mesh	50mm x 50mm x 5mm mesh	18mm F17 Plywood or structural equivalent	Handrail, midrail, kickboard or equivalent
Penetrations in Horizontal Element				
Up to 200mm formed	Implement best protection on a risk assessment basis			
Up to 200mm cut /cored				
200mm ² to 600mm ² formed or cut	Min		Min	
600mm ² to 1000mm ² formed or cut	Min		Double	
1000mm ² and above formed or cut				Min
Penetrations in vertical shafts and walls (<i>other than windows and doors</i>) with no approved edge				
To 400mm			Min	
400mm to 2150mm	Min		Min	
2150mm and above				Min
Other Penetrations				
Column penetration (deck formwork)			Min or F81 mesh	
Pier hole (in ground) to 250mm		Min		
Pier hole (in ground) above 250mm		Min		Min

Note: Jurisdictional requirements may apply

Removal of penetration protection

The following need to be considered

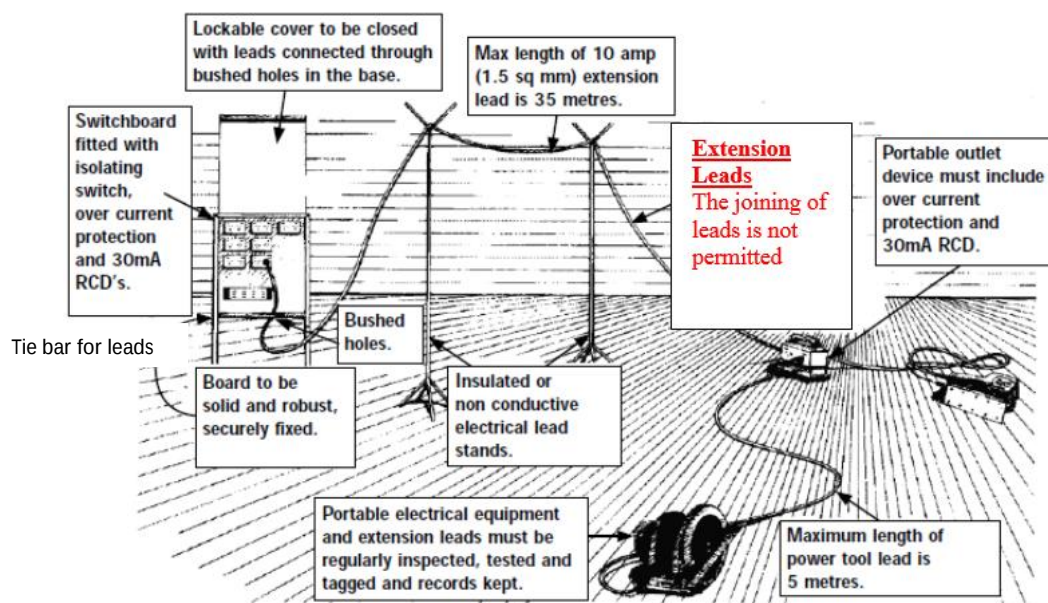
- Before any covered penetration is removed, the supervisor of the relevant trades shall inform the supervisor of their intentions to remove the protective covers, where they are, how many and in what sequence.
- The supervisor shall ensure that, where required, a full exclusion zone with appropriate hard barriers and signage has been erected, to all areas below the penetration.
- The supervisor shall ensure that all trades who are or shall be working in or around the area are informed of the process to remove existing penetrations.
- All access and egress points that are or may be affected by the works are too be reassigned and a visual inspections to verify is to be undertaken by the supervisor and other relevant others where required.
- Communication of access/egress changes to be communicated to all site personnel by methods considered appropriate, such as pre start, builders brief, etc.
- No open penetration is too be left unattended at any time.
- Where the works within or through the penetration is not the final activity, the penetration shall be received in accordance with the requirements of the table above.
- The contractor supervisor shall inform the relevant McNab supervisor when all works are complete at which time the McNab supervisor shall undertake a visual inspection to verify compliance.
- Always remove the penetration protection immediately prior to the installation of the fitting (e.g. service pipes, service ducts, door frames, etc.).
- Whenever possible, leave as much mesh in position.
- When cutting mesh, appropriate control are to be in place i.e. operational safety zone, spotter ensuring no persons are working below (take special care when penetration is part of a shaft).

Where guardrails are to be installed, they must comply with Australian Standard 1657 - Fixed Platforms, Walkways, Stairways and Ladders – Design, Construction and Installation.

References: 'Formwork Code of Practice 2016', 'Managing the risk of falls at the workplace Code of Practice 2021'.

All electrical equipment:

- Must be Industrial rated – generally has thicker insulation, more durable components as well as wiring and are suitable for sustained use. If the operators manual or equipment states – “Not for industrial use”, “DIY use only”, or similar, it cannot be used onsite. Domestic leads, power boards or double adaptors are also not permitted.
- Minimum Intrusion Protection rating of IP33 for outdoor use.
- Must have a visual check carried out before each use by the user.
- Must have leads off the ground on insulated lead stands and/or hooks or protected from damage - not run directly on metals.
- Extension leads are to be no longer than 30m - Extension leads are not joined together.
- Leads and equipment are not to be modified and are fit for purpose – not crushed or pinched, no nicks or cuts in sheath or plugs showing coloured insulation or copper. Any damage should not just be covered with tape.
- If any electrical equipment is found to be defective in any way it must be tagged with an “OUT OF SERVICE” tag, removed from service/quarantined and either repaired or destroyed.
- All electrical equipment **MUST** have a Residual Current Device (RCD) protection which is to be tested prior to use by the user.



In-service safety inspection and testing of electrical equipment for McNab construction sites

- Electrical Equipment **MUST** always be inspected prior to use by a competent person and be tested and tagged. A durable tag must be attached after inspecting and testing to clearly show the test date, the next scheduled test date and the name of the tester.
- Any electrical equipment without a current test tag must be fitted with an “OUT OF SERVICE” Tag.
- Electrical Test and Tag registers must be kept for all equipment and be available onsite. Copies of Contractors registers must be provided to McNab and kept up to date.
- All electrical equipment must be inspected, tested and tagged at 3 monthly intervals.
- All Portable RCD's are to be test tagged at 3 monthly intervals
- All Transportable structures, fixed and transportable equipment and construction wiring including switchboards are also to be test tagged also at 3 monthly intervals.

Reference: 'AS/NZS 3760 In-service safety inspection and testing of electrical equipment, AS 3012 – Electrical Installations – Construction and Demolition sites'

SAFETY HELMET

- Meet AS/NZS 1800 – Occupational Protective Helmets: selection, care and use, and meeting the requirements of AS/NZS 1801 for head protection in building work;
- Must be worn at all times on site, except within an enclosed vehicle / plant cab, or in an exempt area such as site office, lunch room or toilets;
- Helmet is not to be painted or written on in any fashion as solvents can seriously affect the properties of the plastic use in helmets.
- Helmet is not to be cut, drilled or altered;
- Stick on labels, including name tags, may be attached, for example site induction stickers, First Aid personnel identification;
- Helmet is to be replaced every two (2) years from date of issue, after a significant impact or when the helmet displays signs of damage or deterioration;
- Hats or beanies are not to be worn under hard hats

SAFETY FOOTWEAR

- Protective toe capped safety boots that comply with AS/NZS 2210 – Occupational Protective Footwear;
- Safety boots must be fit for task e.g. ankle high boots for structural trades or others working in structural stages of construction;
- Must be worn at all times on site, except within exempt areas where the minimum is enclosed footwear;
- Work activities required to be performed in water or wet conditions, steel capped gumboots should be worn;
- Personnel who are not performing work on site or in the construction zone are exempt from the safety boot requirements. As a minimum, these individuals must wear fully enclosed shoes with a flat non-slip sole and be escorted by a site inducted person

EYE PROTECTION

- Mandatory minimum eye protection to be worn by all personnel on McNab construction sites will be safety glasses with side shields – wrap around type- which comply with AS/NZS 1337.1 – Personnel Eye Protection;
- Additional eye protection is mandatory for the following activities (goggles or full face shield):
 - o Grinding, cutting or drilling metal; concrete or stone
 - o Welding
- Wearers of prescription glasses will need to either wear an over glass (medium impact safety glasses that fit over their glasses) or prescription safety glasses with hardened lenses in an approved frame compliant with AS/NZS 1337.1.

HAND PROTECTION

- Gloves are to be worn by all site personnel when working, as a standard PPE requirement;
- Gloves are to be “fit for purpose” for the job activity;
- Gloves must fit correctly;
- Exemption for wearing gloves:
 - o The activity cannot be practically performed with gloves;
 - o Working with moving machine parts or where there is a risk of a glove being caught in a rotating device

HIGH VISIBILITY CLOTHING

- Wear a high visibility class D garment, shirt, vest and/or jacket whilst on the construction site during day time work and it must be visible at all times;
- Arrange replacement of high visibility garments should they be discoloured, beyond repair or faded beyond 40% of issue colour;
- Wear class N garments for all night work – garments with retro-reflective tape is the design for night use.

COMING ONTO SITE

All plant that will operate on our site or an area under our control (e.g. traffic control area) must have the following prior to commencing onsite. This includes mobile plant that is used as part of a delivery:

- Maintenance/service records available; service must be up to date;
- Operation Manual available;
- Log book available and completed;
- Any relevant regulatory documents (Certificate of registration of plant, annual inspection, 10 yearly strip down etc.);
- SWMS (refer below); and
- Operator site induction

Once evidence of the above has been provided the Plant Inspection report can be completed by the nominated person (via Procure) and if no issues have been found then a **Plant Induction Sticker can be provided to the item of plant**. The plant induction sticker is to be **issued for a maximum duration of 13 weeks and is not transferable from one McNab site to another**. Each site must conduct their own inspection.

If issues are found during the Plant Inspection they must be rectified prior to commencing work on site.

 12001	
 AUTHORISED PLANT	
SITE NAME _____	
INSPECTION NO. _____	
INSPECTION DATE DD / MM / YYYY _____	
INSPECTED BY _____	
CONTRACTOR NAME _____	
RE-INSPECTION RECORD	
DATE DD / MM / YYYY	INSPECTED BY _____
DATE DD / MM / YYYY	INSPECTED BY _____
DATE DD / MM / YYYY	INSPECTED BY _____
VALID FOR 3 MONTHS FROM DATE OF LAST INSPECTION	

Assess ground conditions

Ensuring there is adequate ground stability to support the load is a fundamental step in planning for plant use. Procedures for ensuring that plant does not collapse or tip over are well documented in the manufacturer's instructions. Failure to provide suitable ground conditions to ensure mobile plant stability can lead to the plant overturning, creating a risk of serious injury or death to the plant operator and others nearby.

Factors that affect-ground conditions include:

- The presence of water, including when it is mixed with soil as mud and when it is under the surface (e.g. underground springs or streams)
- The type of ground (e.g. clay, sand rock or a mixture of these).
- Backfilled ground that was previously a trench, excavations or underground services.
- Cavities or penetrations in the ground that have been covered but still exist.
- Continued operation of plant in one location

Other factors that affect plant stability:

- Applied movements from any load
- Ground slope
- wind



Photograph 1: Outrigger pad on fill with no visual signs that the ground is soft.



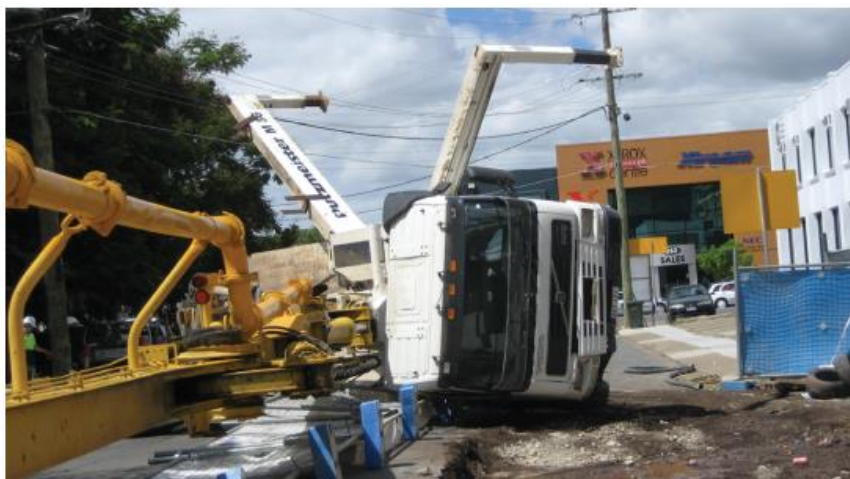
Photograph 2: Outrigger pushed into soft ground after breaking through crust.



Photograph 3: Bog mat used to spread the applied load.

Risk Management:

- Plan ahead for any mobile plant that may be used on your site. (Piling rigs, Mobile cranes, Concrete placing booms, EWP's, excavators etc.)
- Ensure an assessment of the ground conditions have been made and it is suitable for the plant and the expected applied load.
- Details of any trenches, penetrations or underlying services have been identified and information is provided to the plant operator.
- Plant is setup at a minimum proximity to excavations and trenches using (1:1 rule) plus 1 meter
- Continuously monitor the site to ensure changes in ground conditions are managed. (refer to geotechnical report)
- Ensure plant owners provide adequate and suitable timbers and/or pads to spread the load of outriggers, where required
- Where larger items of mobile plant/loads are used or the grounds bearing capacity is unsure, a geotechnical engineer must assess the ground and conduct the relevant tests to confirm the required ground bearing capacity is achieved. (E.g. DCP tests, plate load test etc.)
- Outriggers must be set up in accordance with the manufacturer's instructions.
- Short- legging is only to occur if specified by the plant manufacture and detailed in the operators manual. This should be accompanied with a risk assessment and relevant documentation. E.g. – short legging/one sided support system diagram/permissible operating zone
- Plant must not exceed the SWL. (Lifted load, max occupancy etc.)



Photograph 4: Overturned Concrete Boom Pump

HIGH RISK CONSTRUCTION LICENCES - Mobile Plant

Various types of mobile plant require a High Risk Construction Licence, the common items of plant encountered on a construction site that require a licence are:

Licence	Classification Code
EWP (Boom >11m)	WP
Concrete Placing Boom	PB
Mobile Crane (non-slewing and slewing)	CN, CS, C1, C6, C0
Vehicle Loading Crane (>10 Tonne)	CV
Forklift	LF

The original licence is to be sighted (photocopies will not be accepted). A copy of the licence is to be taken at time of induction and is to be maintained along with the person's induction record.



OTHER ITEMS OF PLANT – COMPETENCY REQUIREMENTS

For all mobile plant, competency to operate shall be provided to McNab and may include one of the following:

- a regulatory licence for the type of plant to be operated (e.g. Licence to operate High Risk Plant as per the relevant legislation);
- a licence for the plant under a former legislative requirement;
- a certificate or statement of attainment issued by a Registered Training Organisation (RTO);
- a record of Verification of Competency (VOC) issued by a Registered Training Organisation (RTO);

McNab may request further verification of competency whenever McNab has cause for concern such as:

- The degree of complexity of the task requires further verification;
- reason to suspect the licence may be fraudulent;
- concern of the operators inability to operate the item of plant safely (e.g. observation or incident);
- where several years have passed since the worker received their licence;
- Where the worker has been out of the industry for an extended period of time.

MANAGING MOBILE PLANT & PEOPLE INTERACTIONS

Controls need to be in place to manage mobile plant and people interactions. Hard barriers are a preferred method to physically prevent people inadvertently walking into high risk zones, such as:

- Front of house (particularly if this is the main loading/unloading area)
- Crane loading zones
- In and out of basements
- Inclines and declines

Exclusion zones must be erected and maintained around mobile plant to prevent unauthorized personnel from accessing the plant work zone.

Operating plant MUST have an exclusion zone that suits the operational requirements of that specific item of plant e.g. – cranes and piling equipment may require larger exclusion zones when lifting large items or using large attachments to allow for uncontrolled movements or plant failure.

Where exclusion zones are not practical are spotter must be in place to manage plant and people interaction.

Use hard barriers that are easily adjustable if they need to be moved for quick jobs. Site fencing is not to be interfered with. Only a McNab Site Representative may advise section(s) to be removed or opened.

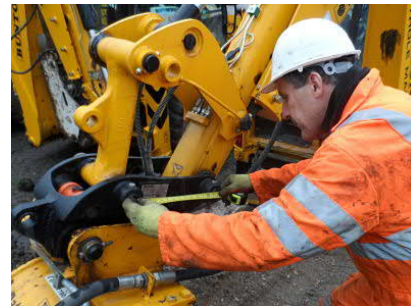
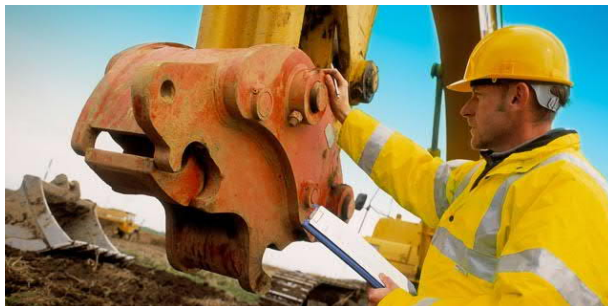
Reference: 'Work Health and Safety Regulation 2011 Part 4.5', 'Managing the Risks of Plant in the Workplace Code of Practice 2021' Concrete Pumping Code of Practice 2019, Mobile Crane Code of Practice 2006.

The main risk arising from the use of a quick-hitch device is that the attachment, such as an excavating bucket, becomes disconnected from the quick-hitch and as a result falls from the machine.

MCNAB MINIMUM STANDARD FOR QUICK HITCHES

- Operators/Owner manual for the Quick Hitch must be with the machine;
- Maintenance inspection records must be kept for the quick hitch;
- Operator to know and implement the quick hitch operation and maintenance requirements from the manufacturer;
- Quick hitches should comply with AS 4772-2008. If it does not, it must be fitted with a manual locking pin;
- Operator to know, check and document the service gap between the hitch and the latching mechanism on a monthly basis;
- All quick hitches must be fitted with a backup system that ensures retention of the attachment to the quick hitch by mechanical and positive means in the event of failure of the primary retention system;
- Means of verifying the engagement of the backup system shall be available from the operator's position. This means shall be stated in the operation and maintenance manual supplied by the manufacturer;
- The backup system needs to be intentionally disengaged for the attachment to be disconnected from the quick hitch.
- The quick hitch shall be marked in a permanent manner with the following information as a minimum:
 - a) The name or mark of the manufacturer or distributor as applicable;
 - b) A unique serial number;
 - c) The mass of the quick hitch in kilograms;
 - d) The host machine class; and
 - e) Rated lift point capacity, where fitted, in kilograms.

Marking shall be in the English language and values shall be in metric units.



Reference: Mobile Crane Code of Practice 2006, AS/NZ 4772 Earthmoving Machinery-Quick hitches for excavators and backhoe loaders, 'Managing the Risk of Plant in the Workplace Code of Practice 2021'

Refuelling plant and portable equipment can create vapours or fuel spills that can be easily ignited by hot engine parts, static electricity or other ignition sources resulting in an explosion and/or fire. People have been burned, many seriously, while refuelling portable equipment.

WHEN REFUELLING:

- turn the equipment off and give it time to cool down;
- move the equipment to outside of the building;
- remove the equipment from inside vehicles;
- remove the equipment from trailers or surfaces (e.g. plastic or rubber) to ground out any static charge built up on the equipment ;
- refuel away from other heat and possible ignition sources;
- refuel in a well-ventilated area;
- do not refuel in low lying areas, where vapours can accumulate;
- refuel only from approved labelled fuel containers;
- use a funnel, to reduce the risk of static electricity and fuel spillage;
- suitable fire extinguishers are readily accessible; and
- replace fuel caps on equipment and fuel containers tightly.

WHEN TRANSPORTING PORTABLE EQUIPMENT AND FUEL CONTAINERS:

- allow the equipment to cool down before loading it onto a vehicle;
- ensure fuel caps are on tight; and
- secure in the upright position in a well-ventilated space.

WHEN STORING FUEL ONSITE:

- only approved labelled fuel containers are used;
- fuel containers are outside vehicles or structures, in a well-ventilated area;
- Locked in a hazardous chemical cage and approved by McNab; and
- SDS's are to be located near the storage area

Wear personal protective equipment (PPE) as per the SDS, such as safety boots, non-flammable long pants and long sleeve shirts, eye or face protection and gloves to further reduce the risk of injury if fuel ignites during refuelling.



Reference: 'Managing the Risk of Hazardous Chemicals in the Workplace Code of Practice 2021', 'How to Manage Work Health and Safety Risks Code of Practice 2021'

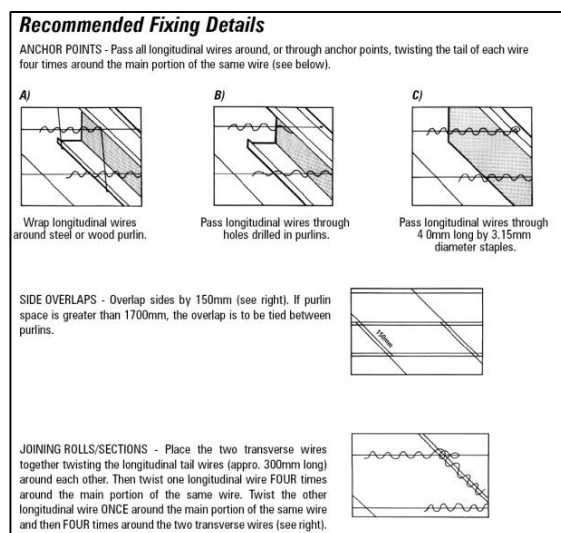
Where safety mesh is required to be installed to a roof no access (other than those installing the mesh) or loading of materials onto the roof is to take place until roof mesh installation signoff has been provided to McNab and has been approved by McNab's Site Manager / Foreman.

When installing roofing, if Roof Mesh is used as a control measure, the following must be adopted:

- The mesh is strong enough to withstand an impact of a person falling;
- Is installed properly so that it retains its strength;
- Conforms to AS/NZS 4389 Safety mesh – i.e. comprises 2mm diameter wire of at least 450 mega Pascals tensile strength, welded into a mesh with longitudinal wire spacing with a maximum of 150 mm and cross wire spacing of 300 mm;
- Is appropriate for the roof – i.e. truss (lateral) and purlin (longitudinal) layout, pitch and span length;
- Is installed safely and in accordance with the manufacturer's instructions;
- Documented evidence from the manufacture outlining installation and fixing details is readily available upon request, preferably attached to or incorporated into the SWMS.

All those involved in the installation of safety mesh must be properly trained and competent to perform the task and provided with appropriate supervision to ensure they work safely.

The following diagram illustrates one type of manufacturer recommended fixing details for safety mesh, this is typically found on the roll of safety mesh.



End joints

- Order the mesh in long lengths so that longitudinal joints can be avoided;
- For longitudinal joints, the knot and tie using the full length of the tail wire – i.e. 300 mm long;
- To get a 300 mm tail wire, the longitudinal wire should be cut close to the joint;
- Tie the first tail wire at least four times around the knot;
- Place the other tail wire under the longitudinal wire and tie around the transverse wire at least four times;
- The joint should be the full width of the mesh, and every longitudinal wire should be joined.

Alternatively, instead of joining two ends of the mesh, secure the ends of the two parts of mesh to the purlins.

NOTE: Different manufacturers may have specific fixing details. Ensure you receive and review the fixing detail for the specific brand of roof mesh being utilised and those installing roof mesh are familiar with the fixing detail.

Reference: 'Work Health and Safety Regulation 2011', 'Managing the Risk of Falls at the Workplace Code of Practice 2021'

A documented Scaffold plan is always required to be compiled by a competent person for scaffolding work.

RPEQ Review and approval

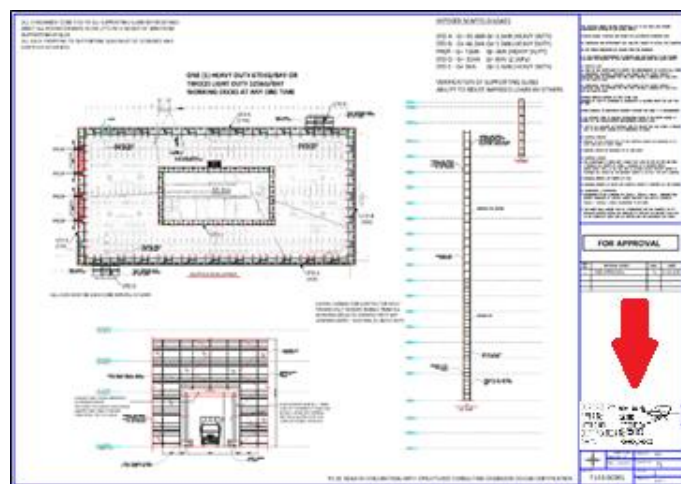
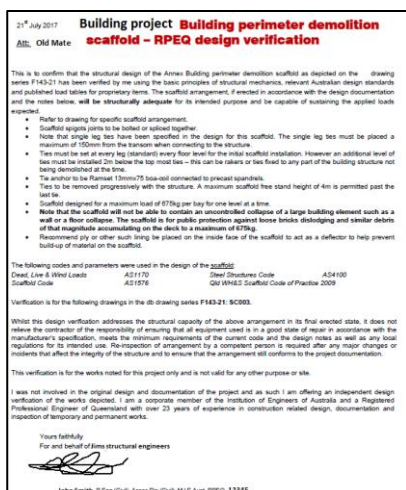
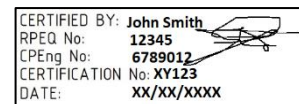
- All Scaffold plans must be reviewed and approved by a Registered Professional Engineer of Queensland (RPEQ). Only the CM can give permission for a non RPEQ scaffold plan, which must have an associated risk assessment.
- Requirement for RPEQ approval to be included in pre-awards, to ensure subcontractor is aware and has capability
- The site team along with the scaffold competent person will determine if a proposed major modifications e.g. structural change, requires another review again by an RPEQ Engineer.
- All other minor changes to scaffold (such as height changes to hop-ups, work platforms, stair direction, entry/exit points, etc.) may be marked up on the existing plan by an intermediate or advanced scaffolder.
- McNab is responsible for organising and providing results for DCP tests for soil weight bearing capacity and design and layout of any existing and planned underground services in proximity to where scaffolding is to be erected. This is a legislative requirement.

Examples of RPEQ review and approval

Right – RPEQ stamp and signed every page.

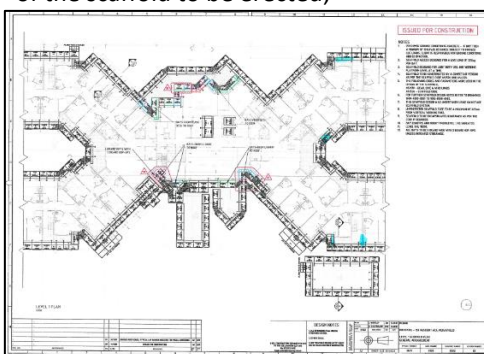
Lower Left – Signed RPEQ Report referencing site layout plan drawings.

Lower Right – Section within site layout plan drawings for signed RPEQ approval.

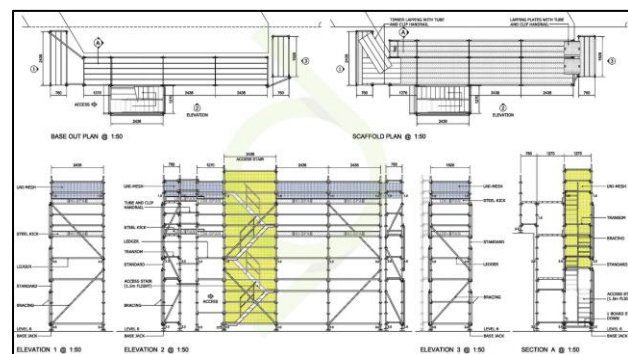


The RPEQ scaffold plan (some may refer to them as design drawing) must include:

- **Site layout plan** - detailed overhead and detailed elevation designs/drawings (not just a general elevation design) of the scaffold to be erected;



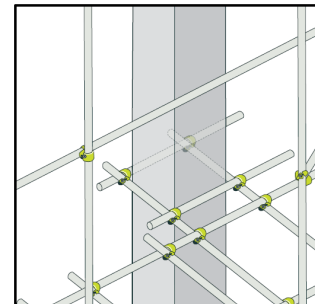
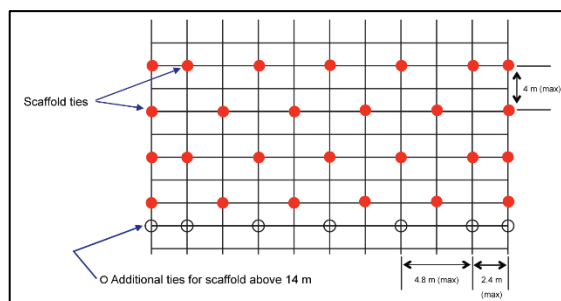
Detailed Overhead design



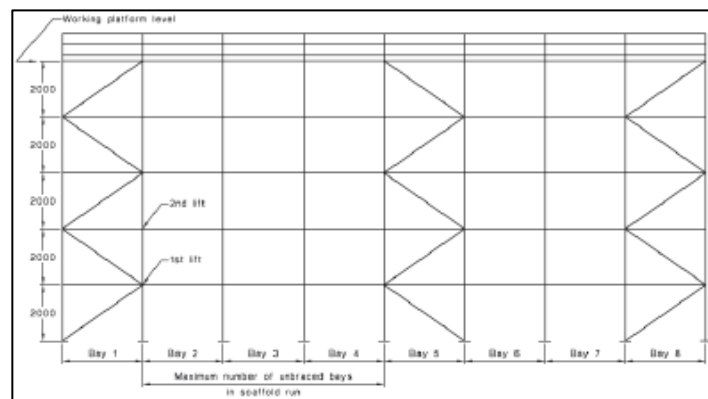
Detailed Elevation design

- **Basis of design** – proprietary system to be used;
- **Foundations** – including ground conditions, weight bearing capacity of surface scaffold is to be erected;
- **Dead loads** – resulting from the size and weight of the scaffold;

- **Live Loads** - weight of people, materials, debris, tools equipment, and impact forces. The maximum duty ratings of the working platforms and loading bays (e.g. Light Duty <2m up to 125kg or >2m up to 225kg ; Medium Duty 450kg; Heavy Duty 675kg; Special Duty above the duty ratings);
- **Environmental loads** particularly the effects of wind and rain on the scaffold and any mitigating measures;
- **Containment sheeting** - mesh, timber, plywood, metal sheeting or other material suitable for the purpose. The framework supporting a screen must be able to bear the load of the screen. Containment sheeting should be installed no higher than the upper most tie, unless certified otherwise by an engineer;
- **Supporting structure** - the capability of the supporting structure to bear the most adverse combination of loads possible when using the scaffold. Where structure is insufficient, back propping requirements must be specified;
- **Entry and Exit points** identified - stair towers (stretcher and access), ladder access, platforms, ramps, hoists – using existing/planned floor levels;
- **Tying** - locations, cast-in/post-in anchor specifications and method for fixing, torqueing, testing requirements and inspection regime;



- **Bracing** – Locations, Longitudinal, Transverse;



- **Edge protection** - specifications on how to install and maintain edge protection; and
- **Design notes** – specifying all of the above requirements as well as any exclusions.

The scaffolding contractor is responsible for supplying:

- Manuals for the component system (e.g Kwikstage, Atpac, Akrowscaff, etc.)
- A copy of the scaffolds design registration
- Scaffold Plan with RPEQ sign off, refer above for information to be included in sign off
- Scaffold tie register
- SWMS for Erection, Maintenance and Dismantle of Scaffold

Copies are to remain available onsite.

Reference: 'Scaffolding Code of Practice 2021'

Handover certificates

Are to be compiled by the licensed contracted scaffolder, for any scaffold where there is a risk of falling over 4m prior to the scaffold being used.

Handover certificates are written confirmation from a competent person who has inspected the scaffold, that construction of the scaffold has been completed, ensuring the scaffold has been erected in accordance with the scaffold plan/design/drawings, the Scaffolding Code of Practice, AS 1576 (1-5) and AS 4576 and to ensure it is suitable for its intended purpose.

For specific scaffold types, the new Code of Practice (COP) requires initial engineering inspections prior to handover (refer to Table 1 from the Scaffold COP) Also note, McNab requires all Scaffold to have design verification by a RPEQ Engineer. By exception, a competent person may approve the scaffold design, as detailed in the table below, but it shall have an associated risk assessment which has been approved by the CM.

Scaffold Code of Practice 2021, Table 1

Type of scaffold	Design verification (1), (3), (4)	Initial inspection (2)
Minor scaffold (less than 2 m TWP) or modular scaffold (less than 4 m TWP)	Supplier or competent person	Competent person
Modular scaffold 4 m to maximum height (5) (6)	Supplier or competent person	Scaffolder
Modular scaffold (with cladding) above 4 m (5) (6)	Supplier or engineer	Scaffolder
Modular scaffold outside of standard documented manufacturer's parameters (7)	Engineer	Scaffolder
Tube and coupler scaffold greater than 33 m TWP or outside of scope of AS/NZS 1576.6	Engineer	Scaffolder
Cantilevered steel beams, trusses or ladder beams (8)	Engineer	Scaffolder
Cantilevered or spurred scaffold (greater than 6 m high)	Engineer	Scaffolder
Bridging beams, truss or ladder beams (greater than 4.8m span or 6m of scaffold above)	Engineer	Scaffolder
Hung or drop scaffolds (8)	Engineer	Scaffolder
Independent free standing or guyed scaffold towers – greater than 4 m TWP (including aluminium static or mobile tower more than 9 m TWP)	Engineer	Scaffolder
Crane lifted scaffold (9)	Engineer	Scaffolder and Crane Dogger
Access birdcages (10) (with cladding or more than 20 m TWP)	Engineer	Scaffolder
Mobile scaffold – greater than 4 m TWP (excluding standard aluminium mobile scaffolds)	Engineer	Scaffolder
Stair tower – independent or attached (more than 20 m high)	Engineer	Scaffolder
Gantry or overhead protection structures	Engineer	Scaffolder
Loading bays (greater than 9 m TWP or 2T) (11)	Engineer	Engineer
Suspended scaffold (swing-stage and supports)	Engineer	Engineer
Perimeter demolition scaffold (more than 9 m high)	Engineer	Engineer
Public access structures (requiring Building Code of Australia compliance)	Engineer	Engineer

Table 1 Planning construction activities (design and inspection table)

A Tie register must also be provided, stating each anchor, setting torque, install date and location and name of the competent person who installed each of the anchors.

Handover certificates are also required following any significant modifications to the scaffold, i.e.: Modifications which potentially affect its structural integrity such as, Extensions, Modifications, change or addition to access and egress points, After weather events, Structural Damage or Dismantling.

Note: Acceptance of the scaffold which then results in a request to make changes later could be deemed a variation to the subcontract agreement.

APPENDIX E – SCAFFOLD HANDOVER OR INSPECTION CERTIFICATE		
A person with management or control of a suspended, cantilevered, spur, hung or other scaffold from which a person or thing could fall more than 4 metres, must receive written confirmation from the competent person that the scaffold has been inspected, completed and is safe for use. This example handover or inspection certificate may also be used for minor scaffolds.		
Scaffold supplier/erector	Client	
Certificate No:	Client Name:	
Company Name:		
Address:	Address:	
	Site Address:	
Contact Phone:	Contact Phone:	
Fax:	Fax:	
Project Details		
Project/Reference Number:		
Description of area handed over:		
Drawings attached:		
Intended use of scaffold:		
Duty Classification:		
Number of working decks:		
Top working platform height:		
3 m Bays:	2.4 m Bays:	1.8 m Bays:
1.3 m Bays:	0.8 m Bays:	Access Bays:
Plant Lifting Registration Number:	Additional Details:	
Handover Inspection of Scaffold		
The scaffold detailed above has been inspected in accordance with the attached drawings and the WHS Regulations and Code of Practice. Scaffolds and Scaffolding Work, is informed by relevant technical standards and is suitable for its intended purpose. <i>Note:</i> A completed scaffold inspection checklist must be provided and attached to this handover certificate, stating all aspects of the inspected scaffold which meet the required standards. All subsequent inspections should be recorded on an inspection checklist and provided to the relevant person.		
Name:	Signature:	
High risk licence No:		
Time:	Date:	
Acceptance – on behalf of the client		
Name:	Signature:	
	Date:	
Arrange for scaffold to be inspected at intervals not exceeding 30 days or immediately following an incident which may affect the adequacy of the scaffold. Design registration number for certificated scaffolding must be kept readily accessible, for example near the scaffold at all times.		

[illegible]

Ongoing Scaffolder Inspections

Arrange for the contracted scaffolder to inspect the scaffold and ties at intervals not exceeding 30 days - A Handover certificate and an updated copy of Tie register must be provided and retained onsite. Signing of the Scaff-tag is not sufficient evidence of an inspection. If any incident occurs, which may affect the stability and adequacy of the scaffold, it must be immediately inspected by the contracted scaffolder.

Note: Scaffolding and any supporting structure is to be inspected following any major storm event or collision (from plant or vehicles) where there is a potential for the scaffold or supporting structure/foundation to be affected.

Reference: 'Scaffolding Code of Practice 2021'

For scaffold erection or dismantling planning, use scaffold inspection checklist 29, Pre Handover & Pre Dismantle Checklist on Intranet and Procore. During scaffold erection or dismantling, or where scaffold is not completed, “Danger Incomplete scaffold” signage is to be erected, along with top and a mid-rails, to help prevent unauthorised access. The whole area is to have all access barricaded off – signage should also be positioned at all areas where persons could climb on, over or through rails to access incomplete scaffold.

Exclusion zones must be established and maintained for the erection and dismantle of scaffolding. Exclusion zones are to be no less than 75 degrees from the highest point of dismantle to the outside of the exclusion zone. In some instances where it is not possible to provide an exclusion zone other means of protecting people from falling objects must be considered and implemented (i.e. gantry).

Scaffold must:

- Have its design registration number displayed at access points
- Be installed in accordance with its design
- Have all scaffold components installed as the scaffold is erected
- Have handrails, midrails and kickboards, and be fully planked
- Have footings, bracing, stair and ladder access
- Not have a mix of components from different proprietary systems unless RPEQ approved
- Have a Certificate of Completion - provided by the erecting scaffolder which is kept on site until the scaffold has been dismantled

Scaffold Licenses and Competencies - Scaffold erection, alteration or dismantle must only be carried out by persons holding the appropriate class of licence for the type of scaffold they are installing. If unsure ask your HSE Business Partner.

Basic scaffolding	Modular or prefabricated scaffold, cantilevered hoist with a maximum working load of 500kg. Materials only , Ropes, jenny wheels, safety nets and static lines.
Intermediate scaffolding	Scaffolding works included in basic scaffolding, tube and coupler, including tube and coupler walkways and gantries, cantilevered crane loading platforms, cantilever and spur scaffolds, barrow ramps and sloping platforms, scaffold associated with perimeter safety screens and shutter and mast climbers.
Advanced scaffolding	Scaffolding work included in basic and intermediate, cantilevered hoists, hung scaffolds, suspended scaffolds.

A person is not required to hold a scaffolding licence to carry out minor scaffolding work where a person or object may fall less than 4m. However, any person carrying out scaffolding work should be competent to erect, dismantle, maintain and alter scaffold. Competence is acquired, through training, qualifications, experience or a combination of these, the knowledge and skill enabling the person to undertake the work.

Ties - Documented verification (Tie register) to be provided by the contractor and retained on site, stating each anchor setting torque, install date and location and name of the competent person installing the anchors.

Internal gaps - Where the internal gap between inner edge of a platform and the face of the building, the slab or structures is greater than 225mm:

- Provide edge protection on the inside edge of the platform
- Provide additional Hop up/scaffold planks to minimise the gap
- Modify/adjust scaffold to reduce the gap to less than 225mm
- Gaps should be eliminated over common access/egress points and closed where work is being undertaken above or beside them. Preference is something solid e.g. secured ply.

Fall from heights prevention

May include proprietary edge protection/guard rail systems, installation of temporary boards - Working from a full deck of planks whenever possible, or other suitable temporary platform. Fall arrest/restraint systems - must be from a rated anchor point/component installed by a competent person. Controls must be detailed in the SWMS. Climbing up the outside of scaffolds is not permitted



Edge Protection - Guard rails, mid-rails, and toe boards must be installed on all open sides of platforms from which people or materials may fall. Where there is a risk of materials falling from the scaffold, containment screening must be provided, e.g. chain-link mesh and shade cloth.

Containment screening

All containment screening (e.g. unimesh and shade cloth) must have a fire retardant rating. Ensure you have this on hand should a WHSQ inspector want to see it and that you have adequate controls to manage this risk.

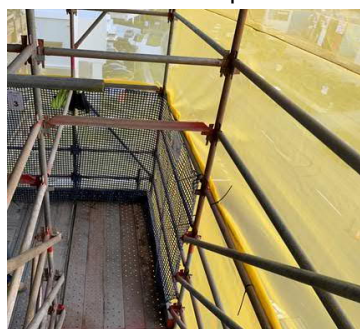
Mesh pattern	Size of mesh openings (max)	Mesh gauge
with prescribed lining*	50mm x 50mm	2.5mm
without prescribed lining*	25mm x 25mm	2.5mm
without prescribed lining*	25mm x 50mm	2.5mm
Not square or other rectangle		
with prescribed lining*	50 mm in any direction	2.5mm
without prescribed lining*	25 mm in any direction	2.5mm

* prescribed lining - shade cloth, or another lining, that has a mean bursting pressure of at least 1000kPa.

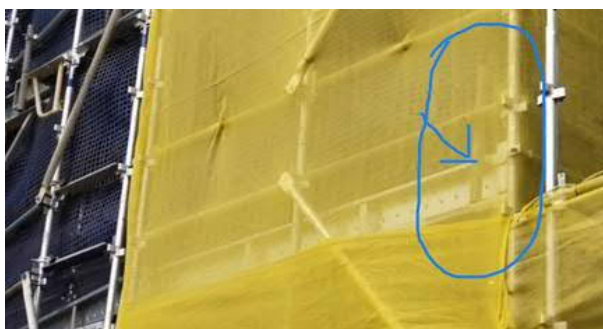
Look out for Atpac, type scaffolding where the toe boards are only 150 mm high, which is shorter than standard size. This can cause problems if Lyta mesh at 1800 mm high is used, as it results in gaps at the top which are greater than legal maximum of 25 mm. It is best to use standard Unimesh at 1900 mm high with Atpac type scaffold.

Stretcher Stair Containment on landings that are on the same level with direct access to the building (i.e. working level):

- Use Uni-mesh (preferred) or ScaffoldGuard on the inside with shade cloth on the outside.
- If using ScaffoldGuard, consider the risk of gaps greater than 25mm and installing in front of the kickboard.
- Lapping of the shade cloth to be greater than 100mm and to be lapped such that a dropped object will not fall outside i.e. top edge of the shade cloth is always outside with the bottom edge of the shade cloth always being inside.
- Where a kickboard cannot be secured at one end, install a short section of tube behind it to secure it in place.



Example of Stretcher Stair with Uni-mesh on the inside landing and shade cloth to the outside



Example of short scaffold tube preventing accidental dislodgement of kickboard



Example of ScaffoldGuard installed in front of a kickboard

Planks

- Sole board size minimum – 500mm long x 225mm wide x 30mm thick hardwood
- No single gap between planks are to exceed 25mm and the total gap between all planks does not exceed 50mm
- Overlapping planks are to be 1.2m long or greater, overlap 300mm or greater and prevented from moving sideways
- When using ply sheets to cover gaps – Minimum 17mm thick and can only cover gaps less than 500mm wide unless RPEQ approved
- Planks should be secured using appropriately rated strapping - any system that is not structurally rated should not be used
- All hop-up brackets should be provided with tie bars to stop brackets from spreading apart, causing planks to dislodge, unless otherwise specified by the scaffold designer
- The overhang of planks which are supported by putlogs should be greater than 150mm but less than 250mm – otherwise uplift might occur
- Avoid nailing or screwing laminated planks into position, unless otherwise specified by the manufacturer. Moisture penetrating the planks can cause damage and may not be easily detected
- Unless outlined in the design, all fully planked platforms are to remain in place until the scaffold is dismantled

Access and Egress

Safe access to and egress from scaffold during the erection, use and dismantling of scaffolding. Include:

- Temporary stairs or portable ladder access systems installed at the start of erection, progressed with the scaffold, and used by the scaffolder whenever possible
- Permanently installed platforms or ramp
- Personnel hoists (non-mechanical forms of egress, such as a ladder or stair tower should be provided in case of emergency)
- Using the existing floor level of a building, provided such access is safe
- First step onto stairs no higher than 300mm. Note: Phasing out of 1.5m stretcher stair risers with 2m risers to help ensure that stair decks are either flush to the working platform or <300mm, this will come into full effect 1 July 2022.
- A perimeter scaffold with a TWP more than 8m high and a length more than 60m long should have two (2) means of access and egress, one for emergency stretcher access a minimum of 1m wide
- Consider controls to reduce the risk of plant around the scaffold i.e. mobile plant and tower crane booms

NDT Testing

The code currently recommends NDT testing of high stress areas of suspended scaffold components to identify cracks that are not easily visible, the NDT should be conducted every three years. Request records of these tests for scaffold that has and/or will be used for suspended scaffold.

Unauthorised Modifications

No part of a scaffold, including any ties, rakers or fixings securing the scaffold to a structure, or part thereof, are to be altered or otherwise modified by any trade other than the Licenced Scaffolding contractor.

McNab Foreman must be contacted if there are components restricting trades works and McNab will consult with the contracted scaffold installer for any modifications/rectifications, where required.

Dismantle

Scaffolding shall be dismantled in the opposite sequence to erection. Handover certificates and documented inspections are to continue until the scaffold has been fully dismantled. Bombing of scaffolding is not allowed, any person caught bombing scaffold components will be subject to McNab HSE warning process up to, and including, permanent removal from McNab worksites.

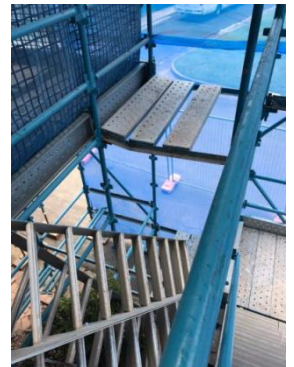
Prior to dismantling scaffold or raising screens, an inspection must take place to ensure all external glazing & balustrade on balconies is installed as per design. If there are any missing components or materials used that are not nominated in the design an engineer must certify the use and or install of all materials to ensure they meet or exceed design requirements.

Reference: 'Scaffolding Code of Practice 2021'

While scaffold “drop in” stairs are not required to be mechanically fixed provided that the gap between the stairs and the transom does not exceed manufacturer’s specifications, this is not “fail proof,” as evidenced in serious incidents in the industry and previously on a McNab site.

McNab have implement a **minimum mandatory standard** when it comes to securing modular stairs on all scaffolds across the business. **Double width stair halves should be secured together with proprietary system bolts as recommended by the manufacturer.**

One of the following methods of securing the modular stairs on all scaffolds must be undertaken without exception:



Clamp securing module to transom



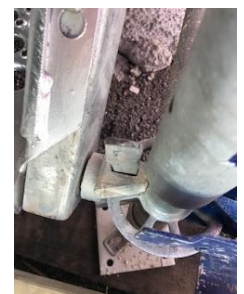
Horizontal tube and clip under stair module



Lock hooks over the transom
(Atpac Builder stairs)



Prop underneath the module

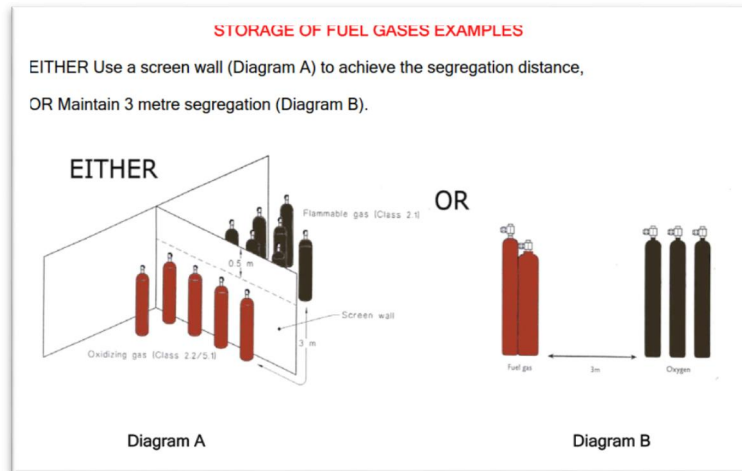


Mechanically secured in each of the 4 corners with locks and welded bolts, they don’t sit on the transom.
(Atpac stretcher stairs)

Reference: ‘**Scaffolding Code of Practice 2021**’, ‘WHSQ Stair Module Failure Alert’

HOW SHOULD GAS CYLINDERS BE STORED?

Cylinder storage areas should be well ventilated and preferably outdoors. Protection from weather is desirable, but not at the expense of ventilation. Within the storage area oxygen cylinders should be stored at least 3 metres from fuel gas cylinders, unless separated by a firewall (minimum 4 hour fire rating).



All cylinders should be treated as full, regardless of their content and the following safety precautions observed:

- Secure cylinders in an upright position, in a well ventilated area.
- Keep cylinders away from ignition or artificial heat sources (e.g. welding leads, flames, heaters etc.) and other flammable materials.
- Store full and empty cylinders separately.
- Protection from direct sunlight is recommended.
- Display "Danger: No Smoking, No Ignition Sources" and "Restricted Area, Authorised Personnel Only" signage in the cylinder storage area.
- Gas cylinders are kept at the lowest possible quantity at the workplace.
- Maintaining and regularly checking cylinders, regulators, hoses and pipes to cylinders to ensure that there are no leaks or dents
- SDS's for each substance must be stored with the cylinders.
- Transport cylinders with appropriate equipment such as trolleys or gas cage.
- Cylinders should be stored so they can be locked away to prevent unauthorised access.

CAN I STORE GAS CYLINDERS IN UNMODIFIED SHIPPING (FREIGHT) CONTAINERS?

No. Unmodified shipping containers should not be used as an alternative to a purpose built cylinder store or stillage.

WHAT SIGNAGE (PLACARDING) DO I NEED ON A SUBSTANCE STORE OR STILLAGE?

Hazardous substance stores and stillage (classified as a minor storage) should have the following signs attached:

- A warning sign to prohibit smoking and to exclude other sources of ignition, e.g. DANGER: NO SMOKING, NO IGNITION SOURCES.
- A warning sign to restrict entry e.g. RESTRICTED AREA, AUTHORISED PERSONNEL ONLY.
- A sign stating that the SDS's are located here.



STORAGE OF SUBSTANCES/MATERIAL

The SDS is the one source of the truth when it comes to hazardous substances/materials. It provides information regarding the chemical composition, storage, compatibility with other hazardous substances, first aid treatment, and firefighting measures, environmental considerations, personal protective equipment and disposal information. SDS should be stored near or with the hazardous substance and be readily accessible.

- Store all substances/materials in a secure, well ventilated area. Ensure the area is signed: “DANGER, NO SMOKING and NO IGNITION SOURCES”.
- All substance containers must be clearly labelled.
- Area for storage must be able to be locked to prevent unauthorised access e.g. Lockable cage
- Only the lowest practicable quantities should be stored on site.
- Substances should not be stored with substances that are not incompatible, refer to the SDS for further guidance.

ENVIRONMENTAL CONSIDERATIONS

All containers with liquids must be stored on or in a container (bund, storage cupboard) that is capable of holding 110% of the volume of the largest container within the storage facility.

A spill kit capable of dealing with the stored volume of chemicals must be easily and readily available at the storage facility. The spill kit must also be compatible with the chemical stored, i.e.: Hydrocarbon – Fuels, or General Purpose, or Acids)



Reference: 'Work Health and Safety Regulation 2011 Part 7', 'Managing Risks of Hazardous Chemicals at the Workplace Code of Practice 2021', 'AS 1940: The storage and handling of flammable and combustible liquids'.

Temporary Works are works carried out to facilitate the construction of the permanent structure and include any physical components which will be removed or made redundant on completion of the permanent structure or works.

Temporary Works are to be designed by a qualified engineer¹. Examples of Temporary Works include:

- Hoardings (A Class, B Class /Gantries and Scaffolding used as a hoarding);
- Party Walls (Domestic construction only)
- Fencing used for fall prevention or perimeter protection (Guard rails);
- Shoring for trenches or excavations;
- Structural support systems;
 - o Needles;
 - o Propping;
 - o Façade retention;
 - o Bracing for precast or tilt up concrete;
 - o Structural steel erection.
- Ramps (for vehicles, plant/equipment and pedestrian traffic greater than 500mm in height);
- Temporary public access platforms and staircases
- Crane loading platforms / Suspended platforms / Purpose built loading platforms;
- Earth retaining structures;
- Overhead protective structures / Gantries;
- Temporary roofs (including those used as part of site office establishment/amenities);
- Working platforms for cranes or piling rigs;
- Tower crane bases, grillages and ties;
- Hoists including mast ties;
- Jacking systems;
- Fixed Concrete Lines;
- Catch decks designed to supporting a load (e.g. demolition material such as a catch deck below a slab penetration for a staircase);
- Perimeter screens (i.e. used in conjunction with formwork)
- Scaffold

TEMPORARY WORKS INSPECTION

To ensure their ongoing stability and structural integrity all Temporary Works and other elements they may support are to be monitored by a competent person ²on a weekly basis as part of the weekly general inspection of the site and associated works.

Details of inspection, including any inspection by the Temporary Works designer, are to be recorded on '06.02 Site Safety & Environment Inspection' or Site Reports in the case of Engineer's inspections'.

TEMPORARY WORKS ALTERATION

No alterations to the Temporary Works, including any part of the structure or element supporting the Temporary Works, is to be carried out without written authorisation from McNab and approval from the Temporary Works designer, RPEQ Engineer (or supplier of the Temporary Works equipment). Alterations are to be done by a ²competent person.

Reference: 'Work Health and Safety Regulation 2011 Chapter 6 Parts: 6.3 and 6.4', 'Tower Crane Code of Practice 2017', 'Excavation Work Code of Practice 2021', 'Formwork Code of Practice 2016', 'Scaffolding Code of Practice 2021'.

¹ 'Qualified Engineer' means someone who is registered under a law that provides for the registration of professional engineers, e.g. Registered Professional Engineer of Queensland.

² 'Competent' or 'Competent Person' means someone who has acquired, through training, qualifications, experience or a combination of these, the knowledge and skill enabling the person to undertake the work.

A Traffic and Pedestrian Management Plan is to be developed by a qualified person¹ and is to be implemented to allow the safe movement of vehicles and/or personnel in and around the site and is to include as a minimum:

- pedestrian access/egress points;
- site vehicle access;
- on-site parking;
- loading zones and delivery points; and
- traffic controls

No person is permitted to place traffic management signs; or direct traffic on a public road unless they are an appropriately licenced traffic controller.



Traffic controllers must be licenced and direct traffic in accordance with the MUTCD (Manual of Uniform Traffic Control Devices) Part 3 (Works on Roads); Traffic Controller Accreditation Scheme Approved Procedures (TCASAP); and the Code of Practice for Traffic Control.

Traffic controllers must:

- maintain a zero percent blood/alcohol concentration while performing traffic control functions;
- not perform traffic control functions while adversely affected by a drug or other medication causing functional impairment;
- not direct traffic through a worksite unless the worksite has an approach speed of 60km/hr or less
- ensure that Traffic Controller Ahead / Prepare to Stop sign is erected correctly and removed after work has been suspended.
- only use equipment specified within the MUTCD Part 3
- not use Mobile phones whilst directing traffic control operations
- carry and produce their Traffic Control licence
- be polite and courteous at all times when interaction with other road users as part of their duties.

The following records must be kept:

- daily records of the sign arrangement or traffic guidance scheme
- records of alteration, installation or removal of regulatory signs
- when implement short term works reference the MUTCD drawing number
- records of all incidents and accidents; including actual width and condition of the travelled path and weather conditions.

Traffic controllers shall be relieved from their duty after not more than 2 hours for a period of rest or “other duties” of at least 15 minutes. [NOTE: “Other duties” does not include operation of a STOP/SLOW bat to control traffic or any duties involving standing in one position, or controlling traffic with a traffic control device].

Consideration must be given to the location of pedestrian crossings if footpath closures are part of the traffic control plan. The provision for ramps to allow prams, trolleys, wheelchairs and the like must be established and maintained.

Traffic and Pedestrian plans should also be developed for the internal of site to prevent the interaction of plant, vehicles and pedestrians and assist in the flow of the works, especially on civil sites, these do not need to be prepared by a qualified person.

Reference: ‘MUTCD Part 3 (Works on Roads)’, ‘Traffic Controller Accreditation Scheme Approved Procedures (TCASAP)’, Traffic Management for Construction or Maintenance Work Code of Practice 2008’.

¹ ‘Qualified Person’ means a person with at least Traffic Management Design Competency as determined under the MUTCD Part 3 or a Registered Professional Engineer of Queensland (RPEQ) with at least a Traffic Management Design Competency.

Controls are to be in place to provide safe access and egress to and from roofs to prevent persons falling. The method selected is generally determined by individual job factors including but not limited to the nature of the work, whether the work is to be performed within 2m of an unguarded edge and duration of works.

Control measures may include:

- Scaffolding
- Physical barricading
- Safety handrail systems
- Fall prevention devices
- Fall arrest systems
- or a combination of the above methods

INSTALLATION AND INSPECTION OF FALL PREVENTION SYSTEMS OR STRUCTURES

Any systems/structures in place to prevent falls are to be installed and tested (where applicable) in accordance with the manufacturer specifications by a ¹competent person and approved engineering design. The design must include specific information on installation requirements including substrate types, product information, depths and/or distances. The design must be provided to McNab and checked prior to completion of any systems/structures.

On completion of the installation a certificate is to be provided to McNab to demonstrate the works have been installed in accordance with the manufacturers specification, engineering design or, where applicable, relevant Australian Standard.

On an existing building or structure evidence of regular maintenance and testing must be provided by the facility owner to McNab.



PERSONAL FALL PROTECTION EQUIPMENT

Fall restraint/arrest systems must only be used if it is not reasonably practicable to implement higher level controls including fall prevention systems, temporary work platforms, edge protection, EWP's etc.

Where McNab have approved the use of a Fall Restraint or Fall Arrest Harness/System no person shall be allowed to use such equipment unless they have been issued with and signed on to an approved SWMS, completed a Working at Heights permit and have successfully completed RIIWHS204D - Work safely at heights.

- Evidence that personnel have been trained in the use, inspection and maintenance of the fall restraint/arrest equipment is to be provided to McNab;
- A fall restraint/arrest equipment register is provided for all equipment to be used confirming that the equipment complies with the relevant Australian Standard requirements.
- Any changes to the task must be communicated to McNab to ensure that the controls, permits and SWMS are updated accordingly.



GUARDRAIL SYSTEM

Where roofing material is to be installed from the roof level, an approved engineered edge protection guardrail is to be fitted where external protection in the form of a scaffold is not provided.

Guardrail must be installed by appropriately qualified personnel in accordance with the manufacturer's specification.

The subcontractor installing the guardrail system must provide McNab with certification of the handrail design and installation sign-off confirming that the guardrail has been installed in accordance with the manufacturers and/or suppliers specification.



WORK AT HEIGHTS PERMIT

This permit will be used for access to an area with live edges or where the use of height safety equipment is required.

Work at height is determined as:

1. Where there is potential for a person to fall 2 meters or more
2. Where a person needs to access an area within 2 meters of an unprotected edge
3. Where height safety equipment will be in use

A work at height permit is not required for routine work from a fixed scaffold, EWP/Scissor or work on a roof with no live edges.

Emergency retrieval of sick or injured workers is to be included in the SWMS.

Access to brittle roofs (Asbestos) or other structurally unsound material is not permitted without a written approval and authorisation from McNab.

Reference: **'Work Health and Safety Regulation 2011 Division 4 -Subdivision 1 & 2, 'Managing the Risk of Falls at the Workplace Code of Practice 2021', AS/NZS 1891 (set), AS/NZS 4994 (set).**

¹ 'Competent' or 'Competent Person' means someone who has acquired, through training, qualifications, experience or a combination of these, the knowledge and skill enabling the person to undertake the work.

UNDERGROUND SERVICE LOCATION

Before any excavation or trenching work commences, ensure that all underground and overhead services are identified. DBYD plans, As Built or survey drawings, and electronic locating / ground penetrating radar reports are to be obtained to provide guidance on the type and general location of any known service.

Where any excavation work will be conducted within 3 meters (either beside or across) of live services, all gas, power and water mains need to be visually identified via the use of non-destructive excavation methods e.g. (Hydro/vacuum excavation & hand digging). This also applies to excavation work outside the site or building boundaries.

Confirmation that visual identification of all live underground services has been completed must be included in the specific controls section of the Excavation Permit.

All overhead electrical services including telecommunications must be managed in line with hazard control sheets 18 & 19.

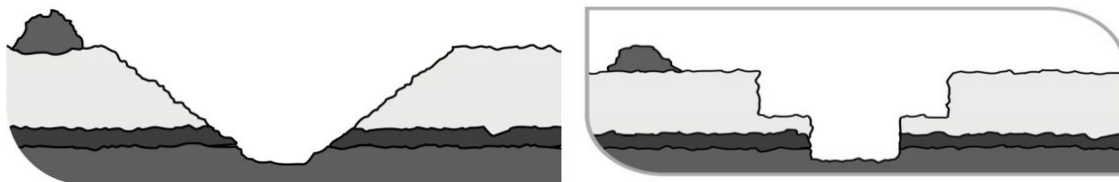
Note: NSW requirements are that the principal contractor must notify Dial Before You Dig of the time and place of the excavation work and no more than 30 days from the commencement date.

EXCAVATION PERMIT

Any excavation works greater than 300mm in depth will be in accordance with the '06.79 Excavation (Dig) Permit'. All identified services must be transferred onto the permit. Information from this permit must be communicated to all subcontractors undertaking excavation works prior to them commencing excavation work. Any excavation work within 3 meters of live services requires Project Manager & Site Manager sign off. Excavations will be regularly inspected to monitor the effectiveness of controls in accordance with the permit. The permit is to be re-signed daily while it remains open. All permits will be recorded on the 06.98 Permit Register.

BENCHING & BATTERING

Excavations & trenches must have controls in place to prevent ground collapse which will include benching, battering or shoring, or a combination of these controls, depending on the characteristics of the excavated material. Benching is the creation of a series of steps in the vertical wall of an excavation to reduce the wall height and ensure stability. Battering is where the wall of an excavation is sloped back on an angle that will not exceed 45 degrees unless designed by a competent person and certified in writing. Battering should start from the bottom of the excavation, see diagram below. A combination of these two methods may be appropriate for some excavation types. Benching and battering may not be required if written advice is received from a geotechnical engineer that all sides of the trench are safe from collapse. The advice should state the period of time it applies and may be subject to a condition that specified natural occurrences may create a risk of collapse.



TEMPORARY SUPPORT SYSTEMS & RETAINING STRUCTURES

Where ground is not self-supporting, and benching or battering are not practical, shoring should be used. Shoring should also be used when there is a risk of a person being buried, struck, or trapped by dislodged or falling material which forms the side of, or is adjacent to, the excavation work. Shoring should be designed by an engineer to carry material and or vehicle loads where required for the specific workplace conditions. Where shoring is in place up to date drawings and plans are to be provided. Shoring is to be installed by a competent person and verified as correctly installed prior to use in accordance with the drawings/plans and checked daily as part of the excavation permit. Where any changes are made to the design or installed system they must be signed off by a qualified engineer. Where excavations are adjacent to any buildings or structures the risk of collapse or damage will be identified and captured in the project risk register and associated risk assessments and monitored daily within the excavation permit.

FALLS

McNab will manage risks to health and safety associated with a fall by a person from one level to another by implementing controls which include but are not limited to:

- Installation of a certified edge protection system
- Installation of landing platforms or scaffold towers inside deep excavations for access to basement excavations
- Installations of physical barriers around excavations over 1.5 meters deep
- Installation of visual barricades/barriers for excavations less than 1.5 meters deep
- Covers placed over pier holes or diaphragm wall excavations.

ACCESS & EGRESS

As much of the work as possible shall be completed on the natural surface (above the excavation) thereby reducing the need for personnel to access an excavation. Access to surfaces more than one metre above or below ground level should be by means of using but not limited to:

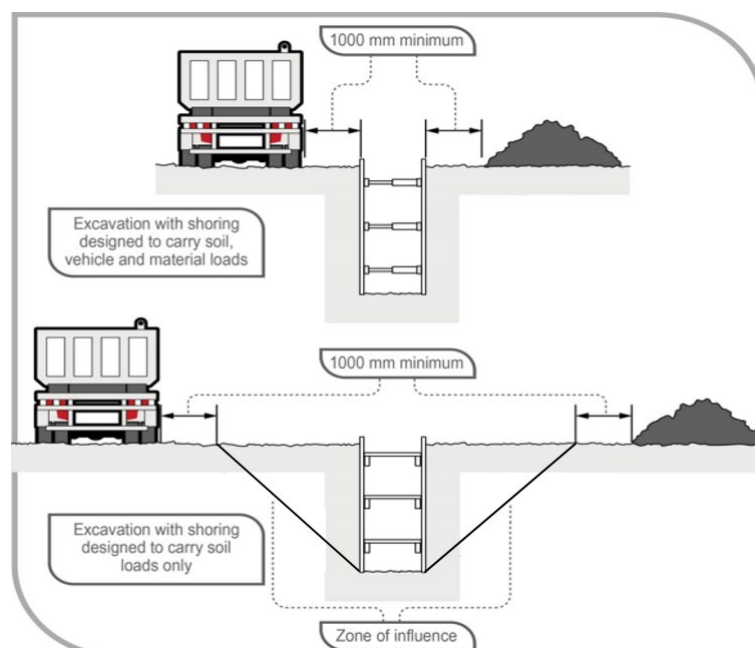
- Stairways
- Ramps
- Secured ladders (as a last resort option)

ATMOSPHERIC CONDITIONS & VENTILATION

Internal combustion equipment (such as vehicles, generators and pumps) must not be operated if there is a risk of the exhaust fumes entering an excavation that is or will be occupied by personnel, or a risk of contaminants/flammable mixtures igniting. If there is atmospheric contaminants or flammable mixture present, work must stop and potential contamination or ignition sources must be removed from the excavation.

BARRIERS & BARRICADES

All barriers and barricades should be placed behind the zone of influence where this is not possible written advice should be provided by a geotechnical engineer. Excavations or trenches over 1.5 meters deep should have a barrier system in place to ensure the area is secured from unauthorised access including inadvertent entry. Mechanical plant, vehicles, storage of materials, or other heavy loads should not be located in the zone of influence unless specified by a geotechnical engineer or the ground support system has been designed by a competent person to carry the loads as shown in the diagram below.



EMERGENCY PROCEDURES

Emergency response procedures will be developed as a part of the McNab Site Specific Emergency Response plan and/or subcontractor SWMS/Health and Safety Management Plan.

MONITORING & REVIEW

Excavation and trenching activities will be monitored through task observations and daily sign off process within the excavation permit.

DEFINITION OF GEOTECHNICAL ENGINEER

An engineer whose qualifications are acceptable for membership of the Institution of Engineers Australia and who has qualifications and experience in soil stability and mechanics and excavation work.

DEFINITION OF A BARRICADE

An object or structure that creates a barrier obstacle to control, block passage or force the traffic flow in the desired direction example photo below.



DEFINITION OF A BARRIER

A physical structure which blocks or impedes something.

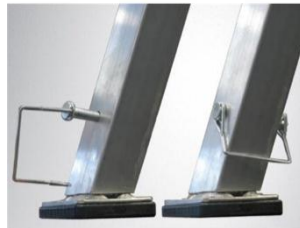


McNab sees the benefit of light weight aluminium work platforms in undertaking low level (not higher than 900mm platform) works on construction sites.

PLATFORM REQUIREMENTS:

McNab has the following mandatory requirements when it comes to work platforms:

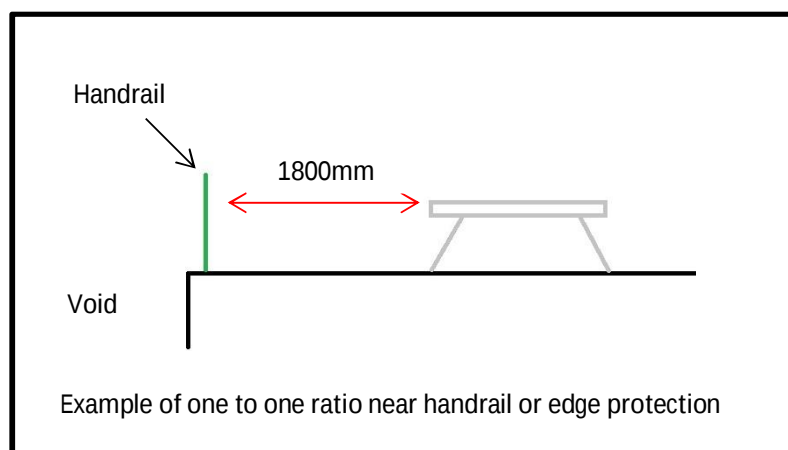
- Must be industrial rated (120kg – do not exceed) with rating displayed and able to be read;
- Must have locking devices to secure the legs in position (manufacturers' design);
- Must not exceed 900mm in height to platform;
- If adjustable height must have locking device to secure the height (manufacturers' design);
- Must be in good working order; and
- Must be suitable in width for the task/activities performed e.g.: 450mm wide as a minimum.



OTHER REQUIREMENTS

Work Platforms are not to be set up where they put the user at risk of a fall from height, i.e.: the user is above any handrails or edge protection (e.g.: balconies, stair wells, podium decks).

A one to one(1:1) ratio must be maintained, this is to the mid point of the height of the person standing on the platform from the edge, i.e.: a man of average height (175cm) standing on a 900mm high platform can not be any closer than 1800mm to a handrail or opening.



Reference: 'Work Health and Safety Regulation 2011 Schedule 19', 'Work Health and Safety Regulation 2011 Chapter 6, Part 6.3, Division 4, Subdivision 3'

The Procore Pre-cast Panel Lifting and Installation Checklist is to be utilised once panels arrive on site.

PRE-DELIVERY

- Entry and exit to unloading area designated - communicated to delivery company;
- Loading and restraint plan - this must include individual panel restraint;
- Safe Work Method Statement for Panels - must include removal of restraints, driver position and procedure for if the load inadvertently crosses over workers during lifting operations; the load must not pass over workers while lifting.
- Lift plan to be available for dogman.
- Safe access for dogman to sling the load;
- Items to discuss at site daily pre-start - Exclusion zones, path of travel and panel lift warning system, crane set up area.
- All relevant information/documentation associated with panels, lifting and installation, including toolboxes and pre-start is to be located in the lifting area and readily accessible for any persons who may need it. May require duplication at the panel install area.
- Pre-cast delivery trucks must have a form of edge protection in place to prevent workers falling e.g.: chain or gate

DELIVERY TO SITE, PRIOR TO INSTALLATION

- Inspection of panels - lifting points, cast in elements like fish plates, Ferrules for panel props, damage;
- Trailer is within 2 degree of level;
- Panel loading and restraint plan is present (dogman to have a copy of plan) and load is configured as per the plan;
- Outriggers to be extended as per manufacturer's specifications, if required;
- Panels are individually restrained (photograph);
- Rigger work area/s established;
- All relevant persons have signed onto the approved SWMS, any changes will require discussion and resigning with the crew.
- Ensure pre-start and toolbox have been carried out with the whole panel crew, refer below.
- Panel crew roles must be clearly defined and identify the person in charge (PIC). Who must:
 - o Hold as a minimum an intermediate rigging licence;
 - o Have experience in panel erection;
 - o Stays for the duration of the task;
 - o Responsible for the final verification checks before authorisation of; the panel lift, the install and, the install as being complete;
 - o Direct and co-ordinate the rigging sequence and panel crew i.e. the:
 - Licenced crane operator (for that type and capacity of crane) and may also include;
 - Licenced Dogger;
 - Licenced intermediate Rigger;
 - Spotter;
 - Labourer skilled in panel installation;
 - Delivery driver;



- Chain restraints are not to be removed from the panels on the delivery truck until the lifters are connected and the crane has the weight of panel. The dogman will notify the truck driver when it is safe to release the chain restraints off the panel. All remaining panels must remain secured on the truck.
- Pre-cast delivery trucks must have certified edge protection along the walk way, including top & mid rails, as well as a system to prevent workers falling from the rear of the truck e.g. chain or gate

INSTALLATION

- Rigger work area established (is the delineation system appropriate) and signage installed.
- Only workers involved with the installations of panels are to be in the rigger work area.
- Panel lift warning system is activated when panel under control of the dogman and crane operator.
- All tools and equipment required for panel installation are at the work zone, sufficient room and clear escape routes.
- Persons installing the panels must be competent and appropriately trained.
- A spotter is in place if required.
- Ensure all lifting gear has been inspected and tagged in date. Reference lifting register to ensure all items are documented.
- Trainees are not allowed to enter the rigger work area during the lift until the PIC has declared the install as complete. They may observe from a safe distance, this detail is to be highlighted in the SWMS.

POST INSTALLATION

- Truck driver to confirm they are happy to depart site (i.e. no issues with truck/trailer, any concerns).
- All actions to be completed in Procore Pre-cast Panel Lifting and Installation checklist, including photographs and documents uploaded.

Reference: 'Work Health and Safety Regulation 2011 Chapter 6 Part 6.1', 'Tilt-up and Pre-cast Construction Code of Practice 2003', 'Guide to managing the risk in construction: Prefabricated concrete'

There is a significant risk from the storage and handling of materials stacked on their edges. Materials may include, but are not limited to, the following:

- Glass sheets, windows or shower screens
- Sheets of stone or marble (e.g. kitchen bench tops)
- Plywood, MDF, chipboard, plasterboard, doors or other building products
- Prefabricated frames and trusses
- Reinforcing mesh and steel plate
- Solar cells (e.g. photovoltaic cells and solar collectors for hot water systems).
- Scaffold standards, ledgers, boards and other components
- Pipes and conduit
- Structural steel, purlins, top hat, etc.

CONTROL ACTIONS

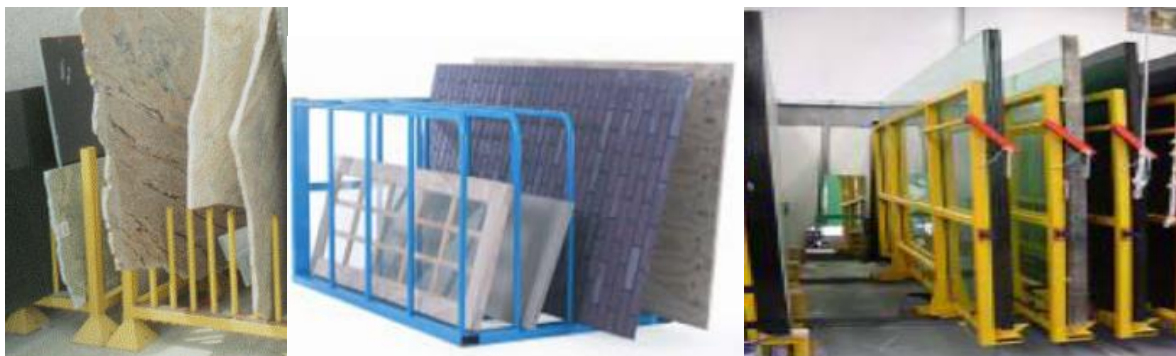
No materials should be stored vertically without restraint. Materials should always be stored horizontally, wherever possible. Understanding space onsite is often at a premium, there may be situations where it is necessary, due to lack of space or any other alternative. The stability and weight of the materials must always be considered to ensure the restraint or support system to be used is adequate as well as the risk of the materials falling when having restraints removed.

In many cases the restraint method may be as simple as:

- Fitting load rated ratchet strap/s positioned higher than the centre of gravity of the item, securing to a column or structural member which must be sufficient to support the material.



- Fixing the load using scrap steel track or wood fixed off directly to the structure.
- Using proprietary racking – these must be designed and certified to support the load being restrained as well as designed and certified for the method they will be used to transport the materials around site. E.g. forklift/Telescopic Materials Handler, crane, etc.



IDENTIFYING THE HAZARDS

McNab understands that the most important defence against respiratory hazards is to control the contamination at its source and prevent it from entering the air. A risk management approach must be undertaken to ensure that respiratory hazards are assessed, documented and controlled. All identified respiratory hazards are to have appropriate control measures established giving due consideration to the levels of risk associated with the activity, task or situation and material being assessed, to ensure that hazards from Respirable dust are minimised. The requirement for air monitoring shall also be determined during this stage or as legislation demands.

MANAGING THE RISK

Many activities can create dust, and exposure to any dust in excessive amounts can create environmental nuisance and/or respiratory problems. Adequate controls for the task must be determined to ensure that risks to health and safety from Respirable dust are minimised giving due consideration to the levels of risk associated with each activity, task or situation being assessed to ensure that risks to your health and safety from respirable dust are minimised. These controls must be documented within the Project risk register and SWMS for tasks.

RESPIRABLE HAZARDS

Particles when breathed in can reach deep into the lungs (excluding gases), may include, but are not limited to the following:

Type	Exposure Limit – max 8hrs	Sources
General Dust	TWA 10mg/m ³	Total dust (of any type, or particle size)
Respirable Crystalline Silica (RCS)	TWA 0.05mg/m ³	Earthworks and rock breaking, manufactured solid stone products such as composite (engineered) stone, asphalt, cement, mortar and grout, concrete, concrete blocks and fibre cement products, brick, drywall and plasterboards, Vermiculite, fire proofing, Spill Kits, block insulation, and pavers and tiles including roof tiles. Refer to McNab Silica Dust Monitoring Poster.
Asbestos	TWA 0.1fibre/ml	Construction materials, insulation products, gaskets, friction brake products, and vehicle and plant equipment that was installed, built, manufactured, commissioned or designed prior to 1 January 2004 may contain asbestos. From 1 May 2021, low density asbestos fibre board (LDB), also known as asbestos insulating board, will be classified as a friable material in all circumstances. This means LDB can only legally be removed by a class A asbestos removal licence holder.
Wood Dust and Formaldehyde	<u>Hard Wood</u> – 1mg/m ³ <u>Soft Wood</u> 5mg/m ³ <u>Formaldehyde</u> – 1.2mg/m ³ (1ppm)	Both wood dust and formaldehyde are carcinogenic. Formaldehyde may be released in both in gaseous form or associated with reconstituted wood dust particles/Medium Density Fibreboard (MDF). When working with wood products, dust and free formaldehyde are released. Formaldehyde is absorbed by the dust particles which may cause cancer when either breathed in or come into contact with the skin, frequently, over a long time period

AIR MONITORING

McNab will engage consultants to perform air monitoring on non-common tasks that have been identified in the Project Risk Register or materials Safety Data Sheet (SDS). If you are not certain that the exposure levels comply, then you must organise for an occupational hygiene consultant to perform undertake air monitoring to establish some certainty.



Personal Air monitoring – sampler must be positioned within breathing zone of worker.



Static Air monitoring – Positioned in fixed locations to determine general exposure levels

McNab has already undertaken air monitoring and sampling. See McNab [Silica Dust Monitoring poster](#) and [Intranet Silica Dust page](#) for further monitored tasks and exposure levels.

CONTROLS

Where possible we always seek to eliminate or minimise dust generating activities, however this is not always possible. All health, hygiene and injury hazards must be monitored on an ongoing basis to ensure controls remain adequate and additional controls or assessments are not required. Preferred controls in order of preference are:

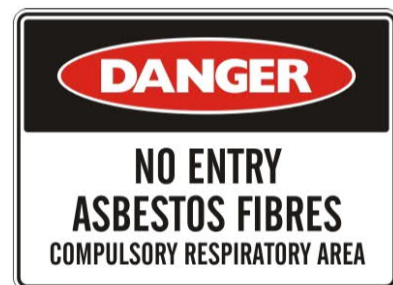
- Eliminate through planning constructions with pre-built recesses and penetrations for plumbing, gas and electric wiring as well as ordering the right size material or getting materials cut to size off-site;
- Substitute the dust generating material for a less hazardous one;
- Isolate or segregate personnel from the hazard utilising designated and signposted Respirable hazard work areas, excluded from non-essential personnel. Ensure materials are enclosed wherever possible or when not in use, such as, open cement/mortar bags rolled up/covered/disposed of, etc;



- Engineering controls, such as Forced ventilation/extraction, Air scrubbers, dust suppression, using wet cut tools - Important to note that the use of a handheld spray bottle, sponge or hose to separately supply water to rotating tools alone, is inadequate to suppress silica dust, tools integrated with vacuum extraction (class M or H with Hepa filter – as minimum) waste to be bagged/sealed and disposed of in general waste. Chemical sealing of concrete may also assist in prevention of dust being generated;



- Administrative measures such as regular proactive housekeeping, using class M or higher vacuums where possible, scheduling tasks and duration to limit exposure, where appropriate conduct health monitoring (Air monitoring shall be conducted as legislation demands, prompted by SDS review's, inspections, etc.) monitor weather conditions, signage and training;



- PPE – McNab require respiratory protection to be worn in combination with higher order controls. Select the most appropriate respiratory protection for the task (e.g. P1, P2, P3 respirators, compliant to AS/NZS 1716) are to be selected. - Workers shall be fit tested and clean shaven for all close fit respirators. Powered air purifying respirators with head covering may be suitable for workers wanting to retain their facial hair, however these

types do have limited battery life, are mechanically driven, so a risk of malfunction is present and you will need to ensure that the manufacturer guarantees performance in foreseeable wind conditions.



Types of Respiratory protective equipment – Left to right -1 Disposable, 2 Half and 3 Full face and 4 Powered air purifying respirator - which also needs to meet impact requirements for eye protection (AS/NZS 1337) as well as protective helmet (AS1801) standards

HEALTH MONITORING

Health monitoring for respirable dust may be required under WHS Regulation. Although crystalline silica is listed in Schedule 14 of the WHS Regulation, health monitoring is required only if there is a significant risk to the worker's health because of the exposure to a hazardous chemical (silica). Regular long-term unprotected exposure of workers > 0.5 TWA is considered a significant risk requiring health monitoring.

KEEPING RECORDS

Record keeping is important where respiratory illnesses/diseases may have long latency (e.g. two or three decades). Records need to be kept for a period of 30 years for all airborne monitoring results and health monitoring records. Note that exposed workers must be able to readily access their exposure records and must be provided with a copy their health monitoring report. Records will be retained and accessible through the McNab HR Department.

INDUCTION, INFORMATION, TRAINING AND SUPERVISION

Inductions, Hazard Control Technical Guides, Project risk registers, SWMS for tasks and SDS for materials shall be used to communicate hazards and controls. McNab will induct supervisors and workers in respirable dust hazards and supervise the implementation of safe systems of work in our workplaces. Records of training will be kept by McNab HR department.

The purpose of this Hazard control sheet is to outline the requirements for the safe management of confined space activities at our workplaces. Specific workplace conditions and jurisdictional requirements should always be taken into consideration. When entering, working in, on or near a confined space, as well as the risk of inadvertent entry. Confined spaces are always to be managed in accordance with *WH&S Regulations 2011 4.3 Confined spaces* and *Confined Spaces Code of Practice 2021*.

WHAT IS A CONFINED SPACE

A confined space is determined by the hazards associated with a set of specific circumstances and not just because work is performed in a small space. Using below, if the responses to A, B, C and at least one of D is yes, then the space is a confined space.

- A. An enclosed or partially enclosed space;
- B. Is not designed or intended to be occupied;
- C. Is intended or designed to be at normal atmospheric pressure while worker is within;
- D. Is likely to be a risk from:
 - i. An atmosphere that does not have a safe oxygen level, or
 - ii. Contaminants, including airborne gases, vapours and dusts, that may cause injury from fire or explosion, or
 - iii. Harmful concentrations of any airborne contaminants, or
 - iv. Engulfment.

Note – Excavations and Trenches are not considered confined spaces based on the risk of structural collapse alone, but will be confined spaces if they potentially contain concentrations of airborne contaminants. Entry to a confined space is considered to have occurred when a person's head or upper body enters the space.

CONFINED SPACE RISK ASSESSMENT

Prior to confined space works a competent person (see table below) must conduct a risk assessment or, if one has already been completed, review that risk assessment to ensure the following:

- Whether the work can be carried out without the need to enter the confined space;
- The nature of the confined space;
- If the hazard is associated with the concentration of oxygen or the concentration of airborne contaminants in the confined space—any change that may occur in that concentration;
- The work required to be carried out in the confined space, the range of methods by which the work can be carried out and the proposed method of working;
- The type of emergency procedures, including rescue procedures, required.

A single (or generic) risk assessment (SWMS) may be carried out for a class of confined spaces in a number of different work areas or workplaces where the confined spaces are the same. This will only be appropriate if all of the hazards being covered are the same. A risk assessment must be carried out on individual confined spaces if there is any likelihood that a worker may be exposed to greater, additional or different risks. A confined space entry permit may be used as a record of the risk assessment.

COMPETENCY FOR CONFINED SPACES

Proof of competency through holding statement of Attainments in the following for their respective role				
Entrants	Confined space entry	Gas test atmospheres	Breathing apparatus	
Spotters	Confined space entry	Gas test atmospheres		
Rescue	Confined space entry	Gas test atmospheres	Breathing apparatus	Confined Space Rescue
Permit Authority	Confined space entry (2 Day Course – including issuing, Monitor and control of permits)			

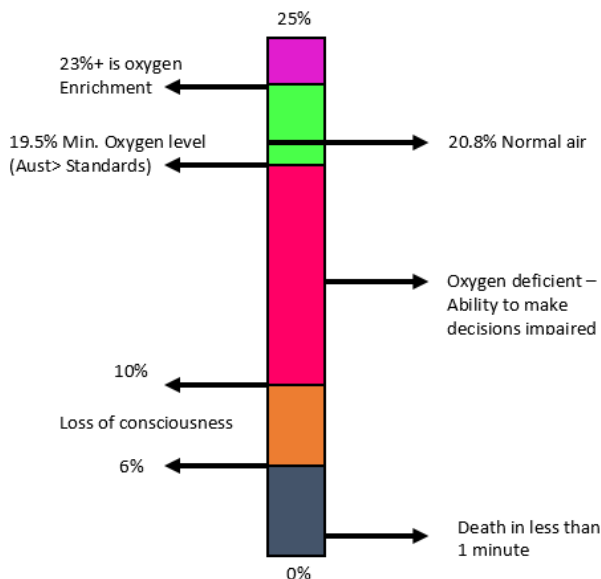
Records of competency must be readily accessible and available for inspection at the Confined space.

ATMOSPHERIC TESTING AND MONITORING

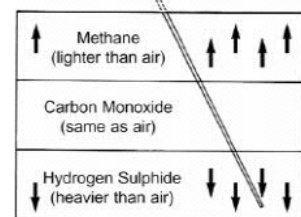
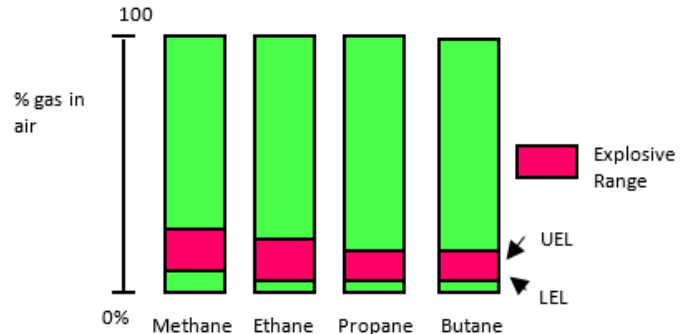
Prior to entry into any confined space, air monitoring must be carried out to determine the airborne concentration of a substance or mixture to which an exposure standard applies if:

- There is uncertainty whether or not the airborne concentration of the substance or mixture exceeds the relevant exposure standard, or;
- Monitoring is necessary to determine whether there is a risk to health

Oxygen Levels and their effects



Common Flammable gas explosive ranges

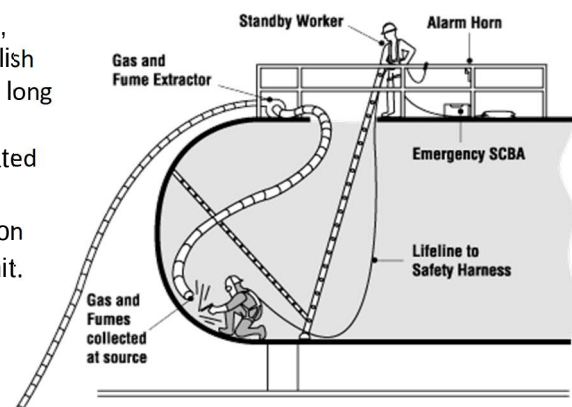
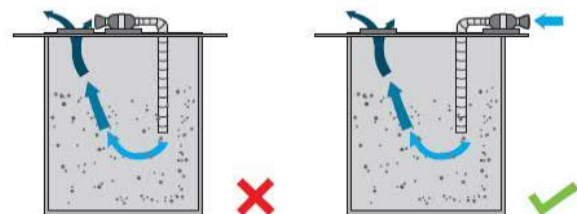


A safe atmosphere in a confined space is one that:

- Has a safe oxygen level
- Is free of airborne contaminants or any airborne contaminants are in concentrations below their allowable exposure standard (if any)
- Any flammable gas or vapour in the atmosphere is at concentrations below five per cent of its LEL.

A safe atmosphere can be achieved within the confined space using methods such as cleaning, purging and ventilation. Temporary control measures such as providing ventilation to achieve a satisfactory pre-entry gas test will not cause a confined space to be declassified.

- Purging should be done in a way that ensures any contaminants removed from the confined space are expelled to a location where they present no further risk.
- When flammable contaminants are to be purged, purging and ventilation equipment designed for use in hazardous areas must be used
- Ventilation of a confined space with fresh air, by natural, forced or mechanical means, may be necessary to establish and maintain a safe atmosphere and temperature for as long as anyone is in the confined space.
- Ensure fresh air brought into the space is not contaminated
- Ensure Exhaust air does not cause other risks to others.
- Record all air monitoring readings, purging and ventilation controls are specified on the Confined Space Entry Permit.



Combustion engine powered equipment must not be used within or in proximity to confined spaces to prevent build-up of carbon monoxide, carbon dioxide, sulphur dioxide, nitrogen oxides and other noxious gasses from entering the confined space.

ENGULFMENT

Engulfment means to be swallowed up in or be immersed by material, which may result in asphyxiation. Examples of materials that may pose a risk of engulfment include plastics, soil, sand, liquids and sewage. Isolation of pipework and inlets must be conducted. Never work in the confined space when rain/waste water has the potential to enter the space. Check local weather forecast for heavy rain events prior to work commencing.

CONFINED SPACE PERMITS

A confined space entry permit is a legal requirement and provides a formal check to ensure all elements of a safe system of work are in place before people are allowed to enter the confined space. It also provides a means of communication between site management, supervisors and those carrying out the work and ensures that the contractor and McNab have checked and authorised the entry to the confined space and it is safe to proceed.

A confined space entry permit must be issued for each entry into the confined space. Each permit only applies to one confined space and allows workers to enter that space. Multiple spaces require multiple permits. A competent person who directs and supervises the work must be nominated and authorised to issue the permits on behalf of McNab.

RESCUE PLANS AND EMERGENCY DRILLS

Confined space rescue plans must be developed, reviewed and understood by all participants and in place at all times prior to confined space activities commencing. Rescue plan considerations include, but are not limited to, horizontal or vertical rescue method, whether rescue personnel will need to enter the space to perform a rescue or the entrant can be rescued without needing to enter the space.

An initial confined space rescue drill is to be planned, conducted and evaluated, to ensure the proposed rescue process will actually work without placing anyone at any additional risk. The evaluation drill should occur prior to confined space work commencing on the project.



Davit arm, Vertical winch rescue



Davit Arm Horizontal winch rescue

RECORDS

The permit must be kept until the work is completed, or if a notifiable incident occurs, for at least two years after the confined space work to which the permit relates was completed.

INDUCTION, INFORMATION, TRAINING AND SUPERVISION

Inductions, Hazard Control Technical Guides, Project risk registers, SWMS for tasks shall be used to communicate hazards and controls. McNab will supervise the implementation of safe systems of work for confined space entry in our workplaces. Records of all training provided to workers in relation to confined space work must be kept for two years. Records of training will be kept by McNab HR department.

Before Telescopic Materials Handlers (TMH) are used onsite, you must ensure that workers who are to use the TMH have been provided with information, training, instruction and supervision that is necessary to protect them and others from risks arising from the use of the TMH.

COMPETENCIES REQUIRED

Is a Forklift High risk Work License (HRWL) good enough? No! Forklifts and TMH's have very different operating capabilities, limitations and characteristics. Including, but not limited to, boom angle, boom extension, load weight and longitudinal and lateral slope effects on stability.

A Certificate of competency Conduct telescopic materials handler operations – TMH issued by an RTO is required to operate a TMH of any capacity, whether it is fitted with just forks or earthmoving attachments.



“Gold Cards” are issued by an industry body outside of the Vocational Education Training (VET) system. You do not require a Gold Card to operate a TMH, however they do demonstrate training and competence in the operation of the plant.



WHEN ARE HIGH RISK WORK LICENSES REQUIRED?

The HRWL requirements for a TMH differ depending on the attachments and the capacity of the plant and whether or not it is slewing or non-slewing.

- A high risk work licence (HRWL) for a non-slewing mobile crane operation (CN) is required for this plant when used as a crane where the capacity exceeds 3 tonne and when fitted with a boom or jib and hook block. (For slewing TMH's a C2, C6, C1, or C0 is required).
- Where plant is fitted with a personnel box attached directly to the main boom and the personnel box can be extended 11 metres or more the operator requires an WP HRWL (Also important to note slewing plant must have second set of controls installed in the box!)



Although some attachments do not require an operator to hold a particular class of HRWL, there is always a duty to ensure training, instruction and safe systems of work have been provided to the operator of any plant.

Reference: 'Managing Risks of Plant in the Workplace Code of Practice 2021', 'How to Manage Work Health and Safety Risks Code of Practice 2021'

Planning for Pre-Cast through the design phase is vital for success of the project.

SAFETY IN DESIGN

- Discussion with the Design Manager and the Project and Site Management should be conducted how the building will be constructed.
- Exclusion zones are to be mapped out on the Site Plan in conjunction with the Pre-Cast erection plan. The zones include the area where a crane could fall over, the panel being lifted falls or another structure being hit by a falling element after being struck by the panel or crane could fall.
- These exclusion zones can include workers on site, site accommodation, neighbouring business and residences and public areas, such as roads or parks.
- Particular attention to be discussed:
 - o Members of the public (neighbours, local business) – can the lift be performed when areas are closed (for example: street closure, performing the lift outside of business hours).
 - o Site personal, can program be achieved without other trades working within these exclusion zones.
 - o The best location for the crane and the site accommodation.
- Where exclusion zones cannot be maintained, such as roads cannot be closed or neighbouring business etc. This should be clearly documented on the Safety In Design Register, together with a formal risk assessment provided to the Pre-Cast or Tilt-up manufacturer.

Where exclusion zones cannot be implemented (lifting over workers).

- When the Safety in Design risk assessment reveals that it is impractical to implement exclusion zones to protect workers and the public, suitable control measures are to be discussed with the designers of these elements.
- The system must be certified by a Professional Engineer with suitable experience (RPEQ or Equivalent).
- An effective back-up lifting systems is to be provided in the event of failure of the primary lifting system:
 - o The back-up systems is to be independent to the primary system.
 - o This systems must be able to withstand the additional impact loading as it takes up and slack between the primary and secondary systems.
 - o Effectively contain the load in the event of the failure of the primary lifting systems
- Where inserts are used for lifting strength they must have a minimum safety factor of 2.5.
 - o *For example: if a panel weighs 4t and provided with inserts capable of lifting 5t, the primary systems must consist of 2 x 5t inserts. The back-up system 2 x 5t meaning a total of 4 inserts available. Note that the back-up system must be independent of the primary system.*

On Site Verification requirements

Prior to lifting any pre-cast or tilt-up panels, documents verifying that the systems is safe to lift must be provided and be assessable at all times by the Foreman (suitable arrangements must be in place if the Site Foreman is not directly overseeing the installation process).

This documentation includes:

- Certification document from the engineer confirming that the design of the system is acceptable. This document should contain:
 - o The panel identification, the drawing numbers, that the lifting inserts included contain a minimum safety factor of 2.5 and the minimum strength of the concrete must reach prior to lifting and the Standards which the Engineer has based their design. The professional qualification of the Engineer, such as their RPEQ Number).
- Concrete testing documents which demonstrate that the concrete has meet the minimum requirements of lifting.

- The lift plan must consider:
 - o The set up position(s) of the Crane
 - o Locations where the panels are going to be lift from and to and the radius of the crane.
 - o Items which may cause interaction during slewing of the crane, such as electrical power lines, walls, other buildings etc.
 - o Where mobile cranes are used, the location of any trenches and penetrations and other obstacles much cause a failure.
- These letters, certification and testing document needs to be easily understood by the Foreman overseeing the process.

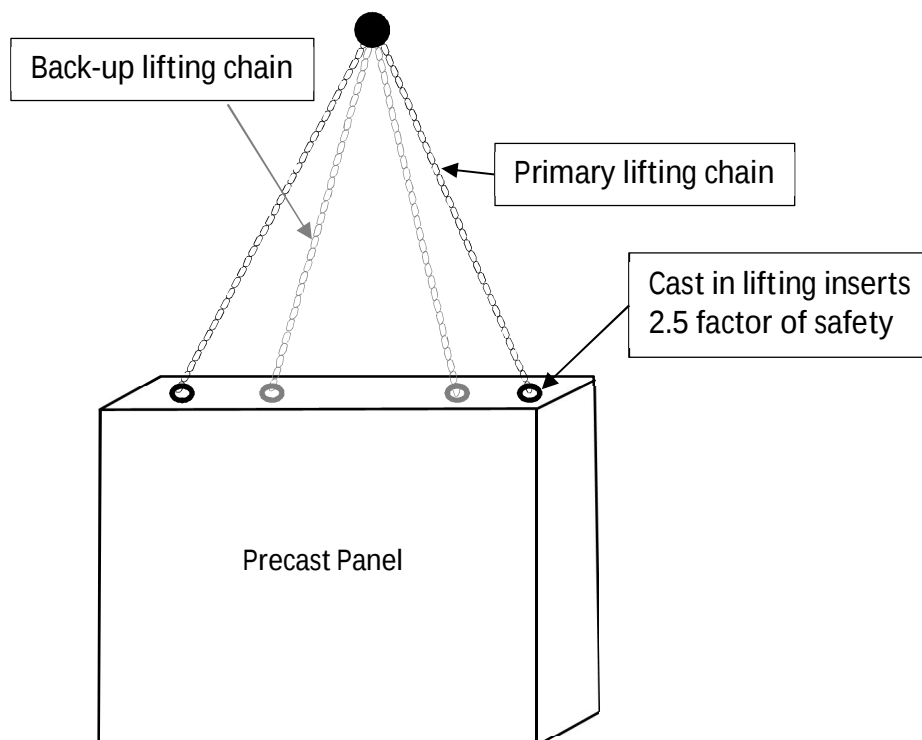


Figure 1- Example of a back-up lifting systems (Precast Panel).

Reference: 'Work Health and Safety Regulation 2011 Chapter 6 Part 6.1', 'Tilt-up and Pre-cast Construction Code of Practice 2003', 'Guide to managing the risk in construction: Prefabricated concrete'