SafeWork NSW

NSW GOVERNMENT

Findings Report

2022 Rooftop Solar Installation Safety

Phase 2

Project findings report - 15 June to 15 December 2022

Summary

In 2022, SafeWork NSW inspectors visited 76 rooftop solar installation sites between 15 June and 15 December 2022. They completed a safety checklist and talked with site supervisors and workers about how to work safely when installing rooftop solar photovoltaic (PV) panels. SafeWork provided advice, guidance and education, checked workers compensation policies, and undertook follow-up visits when necessary. A new solar retailer's checklist was created as an additional resource to compliment the Guide to Safe Solar Panel Installation and installers checklist released in 2021. Inspectors observed a high level of non-compliance at the sites visited, issuing 143 notices, including fines totaling $92,880.

Background

The Clean Energy Regulator estimates that from 2020-2022, NSW registered the most small-scale installations of solar PV systems in Australia with 311,925 systems, followed by Queensland with 254,106 systems, and Victoria with 217,358 systems. The 2022 rooftop solar inspector visit project built upon the key findings of the 2021 solar inspector visit project, where inspectors observed inadequate implementation of fall protections in place, preference for lower order controls such as harness use, and the absence of fall protections during installation.

Communications and Industry Consultation

Communications

SafeWork NSW is committed to educating industry on best practices. The 2022 inspector visit project messaging was primarily focused on work at heights safety, as falls from heights accounts for most traumatic fatalities in the building and construction industry.

Other focus areas included:

- Safety duties of retailers and installers
- Electrical risks
- Falling object risks
- Non-compliant and unsafe harness use.

SafeWork NSW promoted a zero-tolerance approach by inspectors if workers' lives were being placed at risk by unsafe practices. The project site visits were complimented by a new safety checklist for retailers and an updated web landing page. The key messaging in the 2022 project included:

For contractors and solar installers -

- Roof guard rails and scaffolds are the best type of fall protection when working on roofs.
- SafeWork NSW takes a zero-tolerance approach to workers lives being placed at risk, and will issue on-the-spot fines to installers using no or inadequate fall protection.

For solar retailers -

- Solar retailers have duties under Work Health and Safety laws to ensure that those who are providing their services are working safely when installing rooftop solar.
- Safety is not a "tick and flick" exercise, but an assurance that installers are safe.
- Retailers and principal contractors not ensuring safety for their installations can face fines or prosecution.
- Retailers must ensure:
    - Adequate risk assessments have been made for each rooftop installation
    - Have safety plans prioritising fall prevention systems (e.g. roof guard rails)
    - Provision of a site-specific safe work method statement (SWMS), to be abided by all contractors and workers on all jobs.

Focus - The Role of Solar Panel Retailers

Solar retailers who advertise and sell solar photovoltaic (PV) systems may allocate installation work 'in-house' or sub-contract the work to installers engaged as sub-contractors. Retailers and others have responsibilities under work health and safety laws to ensure the health and safety of workers including ensuring a safe work environment, plant, structures, and systems of work.

They are also required to ensure appropriate instruction, training, information and supervision. If the sale of solar panels includes installation, retailers must have systems in place to ensure the salesperson has sufficient knowledge to identify the safety controls required for that installation, for safety measures to be costed into the quotation and incorporated into the installer's safe work method statement (SWMS). For example, the service main may need to be protected or disconnected or a large amount of roof edge protection required.

Industry Engagement

The 2022 engagement with industry was a continuation of the efforts made during the 2021 project and included:

- Consultation and collaboration with the Clean Energy Council regarding safety standards in solar rooftop installations
- Heads of Workplace Safety Authorities (HWSA) presentation on energy and renewables (November 2022)
- SafeWork Wrap and an editorial sent to industry associations for inclusion in their communications
- SafetyCasts Podcast -
    - SafeWork NSW - Safe Solar Installation (2022)- Provides a summary of the Safe Solar Rooftop Installation 2021 Findings Report plus advice on fall protections
    - SafeWork NSW - Safe Solar Installation (2021)- Providing information about the risks, best practice, and educational resources for solar rooftop installation.
- Various presentations to industry.

To promote the project to a wider audience, a social media campaign was conducted on Facebook from 30 June to 31 August and had 1,112,401 impressions with a reach of 249,599 people. The best performing body copy variation from the dynamic ad set up was "We are visiting NSW work sites focusing on solar rooftop installation safety. Up to $3,600 fines apply if workers are put at risk", responsible for 67% of the clicks.

1,112,401

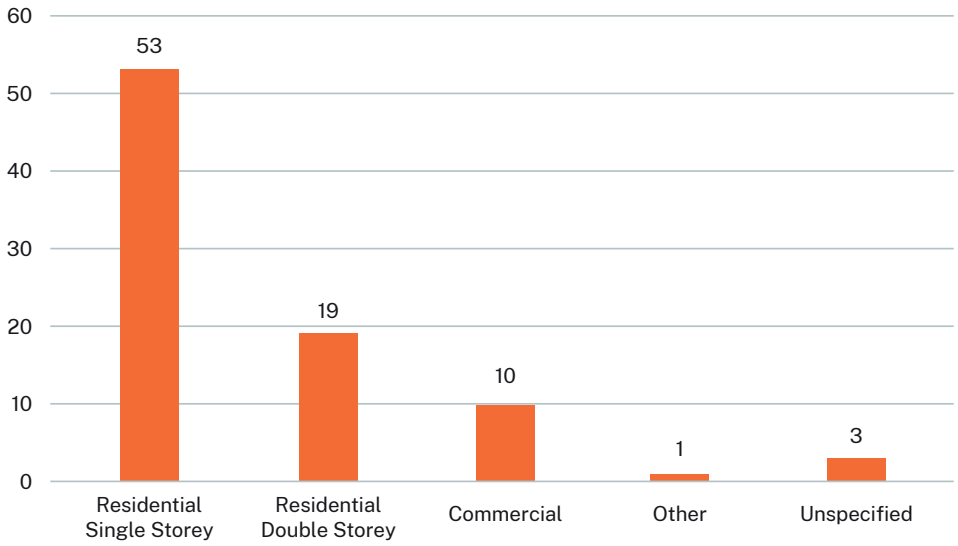
impressions with a reach of 249,599 users

Image 1: Examples of the Facebook media campaign

Inspector Site Visits and Observations

SafeWork NSW Inspectors completed a safety checklist to reflect their observations, which covered a range of issues including safety planning, risk management, as well as falls from heights, electrical and falling object risks. SafeWork NSW inspectors visited 86 sites where rooftop solar was being installed. Where site type was noted (Graph 1), 62% were residential single storey buildings, 24% were residential two storey buildings, 13% were commercial buildings, while 1% was classified as 'Other' (a shed). Inspectors secured compliance where required and observed the following:

Site Type



Graph 1: Type of worksite visited by inspectors 15/6/22 - 15/12/22

Notices and Fines

Inspectors issued 148 notices, including 50 improvement, 56 prohibition, 4 section 155, 1 section 171 and 37 penalty notices totaling $92,880. The majority of notices issued were for falls from heights risks, followed by falling objects risks, electrical risks, and lack of access to a safe work method statement (SWMS).

$92,880

148 Notices

Planning For Safety

Solar retailer oversight of safety

As solar retailers have responsibility under work health and safety laws to ensure the health and safety of workers, SafeWork inspectors explored the relationship between retailers and installers as part of the 2022 solar project.

Of the 40 installers who were asked about their safety relationship with retailers, inspectors found that:

- 43% (17 of 40) had retailers who did not require evidence from the installers that they were putting adequate safety controls in place.

Of the 57% (23 of 40) installers who reported providing evidence of safety planning and/or systems to retailers, these included photographic evidence, SWMS and via an App. Most evidence was provided before the start of the job (69%), at the start of the job (15%) or at the completion of the job (4%).

Safe Work Method Statements

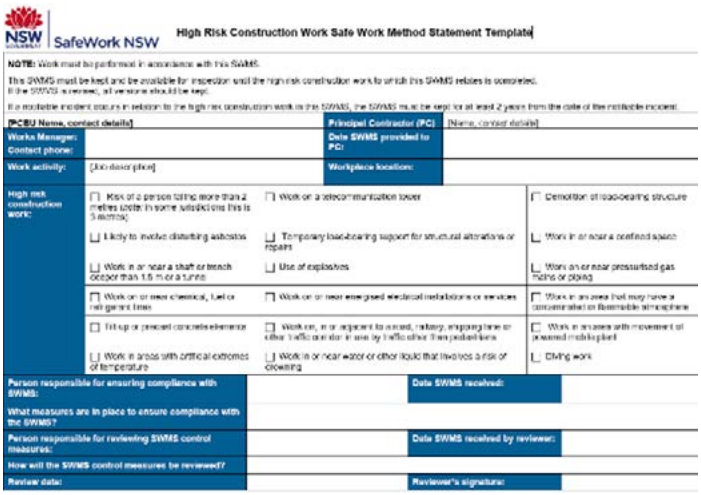
The completion of a safe work method statement (SWMS) is an important way to plan a safe worksite and to communicate safe work practices to those working on site. Under Clause 299 of the Work Health and Safety (WHS) Regulations 2017, a SWMS must be completed for high-risk work. For the context of solar installation work, this is likely to include for work at heights, work with or near electricity and disturbance of asbestos. Clause 300 of the WHS Regulations requires that the high-risk construction work is carried out in accordance with the SWMS.

When it comes to safety planning, inspectors found that:

- 22% of sites did not have a SWMS for high-risk construction work (i.e. for falls and electrical risks),

Where there was a SWMS:

- 21% of sites SWMS were inadequate (i.e. were not task specific, did not have adequate controls)
- 49% of sites were not following the planned safety measures outlined in the SWMS.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High Risk Construction Work Safe Work Method Statement Template

NOTE: Work must be performed in accordance with this SWMS.

This SWMS must be kept and be available for inspection until the high risk construction work to which this SWMS relates is completed.

If a notifiable incident occurs in relation to the high risk construction work on this SWMS, the SWMS must be kept for at least 2 years from the date of the notifiable incident.

[PCBU Name, contact details]		Principal Contractor (PC)	[Name, contact details]
Works Manager: Contact phone:		Date SWMS provided to PC:	
Work activity:	[Job description]	Workplace location:	

High risk construction work:

- ☐ Risk of a person falling more than 2 metres (refer to some jurisdictions this is 3 metres)
- ☐ Work on a telecommunication tower
- ☐ Demolition of load-bearing structure
- ☐ Likely to involve disturbing asbestos
- ☐ Temporary load-bearing support for structural alterations or repairs
- ☐ Work in or near a confined space
- ☐ Work in or near a shaft or trench deeper than 1.5 m or a tunnel
- ☐ Use of explosives
- ☐ Work on or near pressurised gas mains or piping
- ☐ Work on or near chemical, fuel or refrigerant lines
- ☐ Work on or near energised electrical installations or services
- ☐ Work in an area that may have a contaminated or flammable atmosphere
- ☐ Tilt-up or precast concrete elements
- ☐ Work on, in or adjacent to a road, railway, shipping lane or other traffic route in use by traffic other than pedestrians
- ☐ Work in an area with movement of powered mobile plant
- ☐ Work in areas with artificial extremes of temperature
- ☐ Work in or near water or other liquid that involves a risk of drowning
- ☐ Diving work

Person responsible for ensuring compliance with SWMS:		Date SWMS received:	
What measures are in place to ensure compliance with the SWMS?			
Person responsible for reviewing SWMS control measures:		Date SWMS received by reviewer:	
How will the SWMS control measures be reviewed?			
Review date:		Reviewer's signature:	

Image 2: SWMS template

Falling Objects Risks

- Inspectors observed that 39% of sites did not have an exclusion zone established around the work area to prevent the public accessing the site and/or persons being hit by falling objects.
- 37% of sites did not have a safe system of work to move panels onto the roof (e.g. did not use a panel lifter, rope/panel bag, scissor lift etc.).

Electrical Risks

- Inspectors observed that the primary electrical risk on sites was that 14% of sites did not have a lock on the main switch or the meter box itself (i.e. no lock out/tag out procedure "LOTO").
- 2% of sites visited had not switched the electricity off at the meter box and 1% had electrical work being undertaken that was not appropriately supervised by a licensed electrician.

Falls from Heights Risks

Part 4.4 of the Work Health and Safety Regulation NSW 2017 requires that a person conducting a business or undertaking (PCBU) manages the risks of falls from heights by ensuring that the hierarchy of control is followed. The below table is taken from the Guide to Safe Solar Installation and explains the practical application of the hierarchy of control when it comes to working on a roof.

Controlling the risk of falls	Examples
In the first instance, a fall prevention device must be used. Only where it is not reasonably practicable to use a fall prevention device you can then consider ↓	A fall prevention device such as a scaffold, temporary edge protection or an elevating work platform (EWP)
...a work positioning system and if this is not reasonably practicable you can then consider ↓	A total restraint system
...a fall arrest system	Static lines, adjustable restraint lines, catch nets

Table 1: Hierarchy of Control in practice

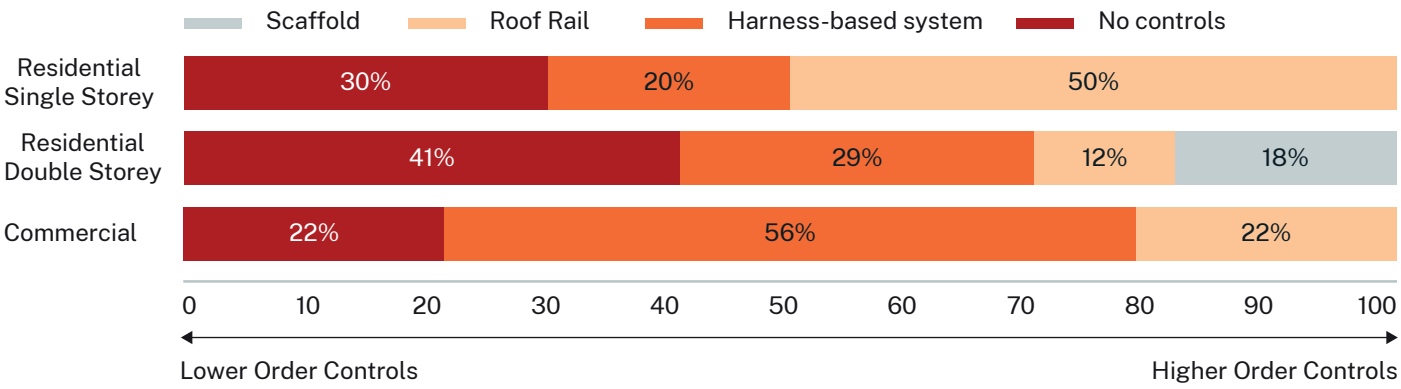
Inspectors recorded their observations on how the hierarchy of control was being implemented in practice on site. Graph 2 outlines their observations as a percentage, broken down by single storey, double storey and commercial properties, and shows that higher order controls are not being implemented as required.

Inspectors observed that:

- Of the sites that had fall protections in place, 54% were not adequate to keep workers safe
- 42% of sites did not have adequate controls to prevent a fall through a brittle or fragile roof materials (e.g. no skylight covers, roof mesh, physical exclusion zones etc.)
- 36% of sites did not have safe access and egress to the roof
- When ladders were used for access, 33% of sites had ladders that were not fixed at the top and/or the ladder did not extend at least 1-metre past the landing.

Graph 2 suggests that lower order controls are being used in larger percentages on higher installations, and this is also the case for no controls at all. The amount of no fall controls is consistent with the 2021 findings, which is of concern considering the rate for residential single storey was 30% and residential double storey was 41%.

Fall Protection Usage on Site

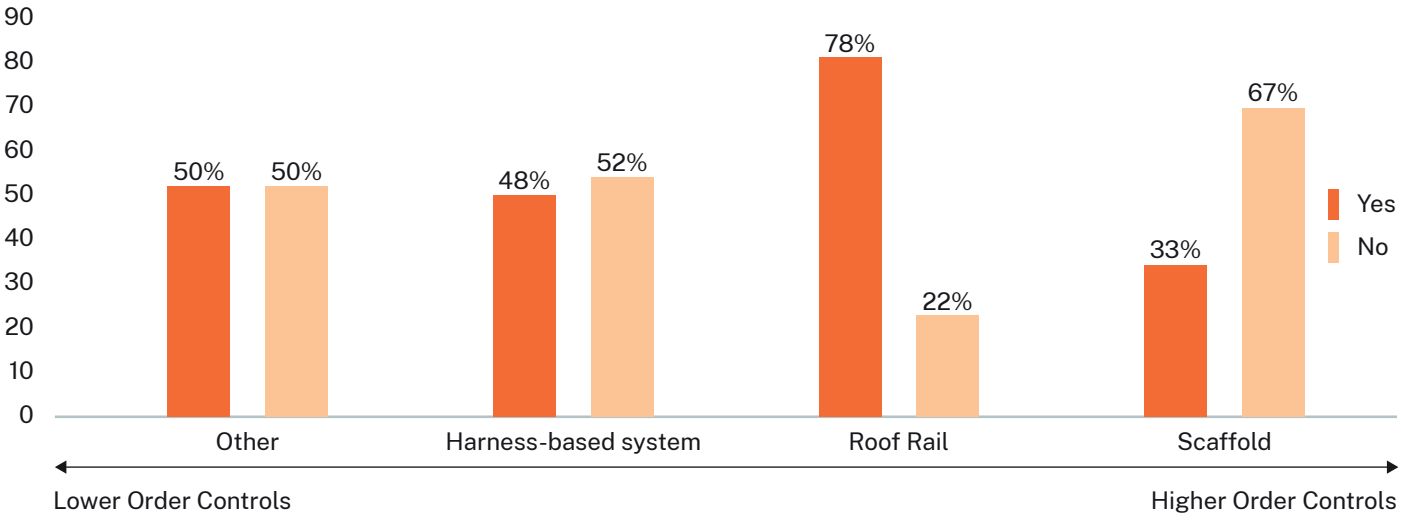


Graph 2: Percentage of type of fall protection used broken down by site type during inspector visits 15/6/2022 – 15/12/2022

Harness use on commercial buildings is due to the pre-installed anchor points and restraint systems on their roofs, which is required for any future maintenance work, and some include the installation of roof guard rails.

The data in Graph 3 details the adequacy of fall protections implemented for both lower and higher order controls. There is a stark difference between the numbers for harness-based systems and roof guard rails.

Adequately Implemented Fall Protections

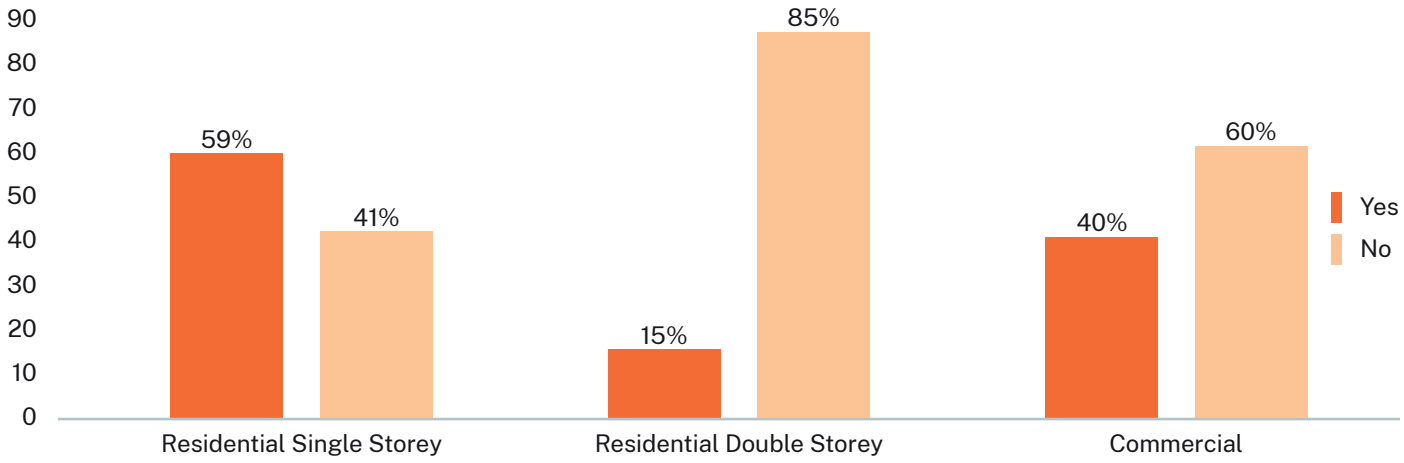


Graph 3: Percentage of adequately implemented fall protections on inspector observed sites 15/6/2022 – 15/12/2022

Scaffold had a sample size of 3- so it is not indicative of any wider trend. 'Other' classifications were: 'Combination of roof rail and harness-based system being used' (Yes), 'Roof rails on East side, entry point but No edge / fall protection for the North side, front facing' (No).

The data in Graph 4 shows concerning observations about fall protections on residential double storey buildings. Due to the high use of either no fall controls or harnesses-based systems, the data suggests concerns about the lack of higher order controls used on residential double storey sites.

Adequate Fall Protections on Site



Graph 4: Adequate fall protection implementation percentage on inspector observed sites 15/6/2022 – 15/12/2022

'Other' category had one site, which had adequately implemented their fall protection

Risk-based Prosecution- Solar Rooftop Installation

This court outcome resulted from SafeWork NSW committing to a zero-tolerance approach to safety in construction work. This case highlights these important messages:

- The importance of ensuring higher order controls are implemented to protect against falls risks
- Retailers' duty to ensure the health and safety of installers engaged and the installers' duty to ensure the health and safety of workers conducting work
- Prosecutions occur for cases where injuries do not occur.

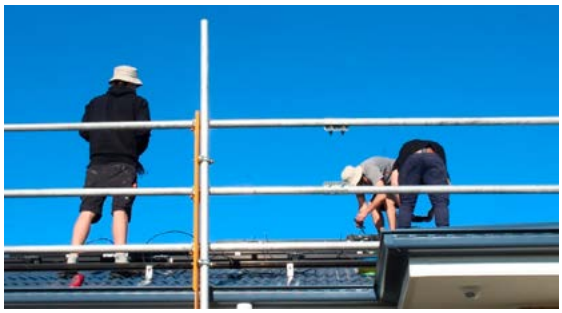
Solar installer and retailer convicted in risk-based prosecution

SafeWork NSW engaged in a risk-based prosecution involving both a solar installer company and a solar retailer, where there was a significant falls from heights risk during the installation of a solar PV system on a residential two-storey home. They were found in breach of clause 79 (2) and clause 299 (1) of the Work Health and Safety Regulation NSW 2017 for failing to:

- Minimise the risk of a fall by not providing and maintain adequate protection against the risk
- To ensure a safe work method statement was prepared for high-risk construction work.

Two workers were exposed to a potentially fatal falls risk, one of approximately 2.4 metres and the other approximately 5 metres. Exposing workers to falls risks is enough to be prosecuted, even if no injury or falls event happens. The installer pleaded guilty to both breaches and was fined $19,644. The retailer pleaded guilty to both breaches and was fined $18,190.

Harness Use



SafeWork NSW promotes the use of roof guard rails and scaffolds as higher order controls when undertaking work on roofs. Harness-based systems may only be used when it is not reasonably practicable to use scaffold or roof guard rails. Inspectors continue to observe unsafe harness use with a significant number of sites not setting them up correctly and users not using them safely.

For harnesses not set up correctly:

- 61% of sites did not have a plan or diagram that showed the system layout, including access points, anchor point locations, location of fall hazards
- 61% of sites with improvised anchors were not connected to a structurally adequate point
- 58% of sites using fall arrest did not ensure there was enough clear space to prevent impact (e.g. not accounting for free fall distance + device slip + shock absorber extension + user height + residual clearance)
- 46% of sites had harness systems that did not allow for connection onto the system prior to exiting the ladder
- 41% of sites did not install multiple anchors to cover the working area
- 38% of sites did not install the proprietary anchor points in accordance with manufacturer instructions.

For workers not using harnesses correctly:

- 30% of sites had workers who were not wearing harnesses correctly (e.g. harness not firm or oriented correctly, leg loops not attached etc.)
- 64% of workers who were wearing harnesses were not connected to the harness system
- Despite the high levels of unsafe harness use , 82% of sites had harness users that had received training in the use of harness-based systems.

Recommendations

Falls from heights continues to be the number one cause of traumatic fatalities on NSW construction sites. This report showcases the continual high levels of unsafe work in the rooftop solar installation industry.

Industry Recommendations:

- Retailers and installers understand that they have an obligation under the work health and safety laws to ensure that higher order controls are used and safe work practices are being followed when installing rooftop solar panels (e.g. safety checklists)
- Rooftop solar governing and industry bodies are encouraged to educate accredited retailers and installers of their responsibilities when it comes to the protecting workers from the risks associated with rooftop solar installations
- A culture of embedding safety into solar quotations and contracting arrangements needs to be developed
- Safety planning needs to be embedded into business, including retailers putting systems into place to ensure safety is planned prior to the job and validating that their contractors are implementing the planned safety systems for each job.

SafeWork NSW Recommendations:

- SafeWork NSW will continue to enforce the use of the hierarchy of control, as it provides the best risk management tool in evaluating the ways to controls the risks of falls on worksites
- SafeWork NSW will continue to ensure that safety information and resources are easily accessible, with key information about working safely at heights in construction being found on the SafeWork NSW website.
- SafeWork NSW will continue to work with industry to communicate safety responsibilities and secure compliance to protect workers from the risk of falls and other harms
- SafeWork will continue to take a zero-tolerance approach to workers lives being placed at risk when installing rooftop solar
- SafeWork NSW will continue to prosecute those who are non-compliant and placing workers lives at risk.

More Resources

- Solar Rooftop Safety Guidance
  - Guide to Safe Solar Panel Installation
  - Solar Installer's Safety Checklist
  - Solar Retailer's Safety Checklist
- SafeWork SafetyCasts
  - SafeWork NSW - Safe Solar Installation (2022)
  - SafeWork NSW - Safe Solar Installation (2021)
- Pocket Guide
- Toolbox Talks
  - Using Ladders in Construction
  - Using Scaffolds in Construction
- Codes of Practice
  - Managing the Risk of Falls at Workplaces
  - Managing the Risk of Falls in Housing Construction
- Edge Protection Fact Sheet
- Solar Rooftop Installation Safety Findings Report 2021

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SafeWork NSW, 92–100 Donnison Street, Gosford, NSW 2250
Locked Bag 2906, Lisarow, NSW 2252
Customer Experience 13 10 50
Website www.safework.nsw.gov.au