

Findings Report

Safe Rooftop Solar Installation 2021



Project findings report - 1 March to 31 December 2021

Background

The installation of Solar photovoltaic (PV) systems has increased markedly over recent years in NSW, in part due to State and Federal Government rebates. The [Clean Energy Australia 2021](#) report notes that NSW installed the most new rooftop solar capacity of all states and territories in 2021, adding 996MW throughout the year, with accredited installation companies increasing 25% to 1,464 and installers increasing 13% to 8,682 Australia-wide.

The primary work health and safety risks associated with rooftop solar installation include falls from heights and contact with electricity. Falling objects (e.g., solar panels), asbestos exposure and musculoskeletal injuries are also of risk.

SafeWork NSW inspectors visited 286 sites between 1 March and 31 December 2021, where rooftop solar panels were being installed, in order to complete a safety checklist and talk with site supervisors and workers about how to work safely when installing solar.

Inspectors observed an unacceptable level of unsafe work when it came to falls from heights risks, issuing 98 improvement notices, 128 prohibition “stop-work” notices and 39 penalties totalling \$123,984.

A Guide to Safe Solar Panel Installation and accompanying installers safety checklist was released to provide guidance and advice to industry as part of this project.

Industry consultation and communications

SafeWork NSW consulted and collaborated with solar-related NSW government departments including NSW Fair Trading, NSW Department of Planning and Environment and Clean Energy Regulator, as well as industry representatives including Clean Energy Council, Solar Energy Industries Association and the Smart Energy Council, to develop guidance material and communicate safety requirements with accredited installers and retailers.

Project communications included emails to industry associations, unions and other industry representatives, a Ministerial media release, industry magazine articles, development of a new solar installation landing page on the SafeWork NSW website and frontpage website scroller, and socials advertising on Facebook and YouTube which saw 149,522 impressions and 108,459 people reached, mostly males aged 25-34.

Nine online industry presentations were also held with accredited installers and retailers. Those attending the presentations were offered access to the SafeWork NSW small business rebate to assist in the purchase of safety equipment such as temporary edge protection.

Inspector Site Visits

Sites visited

SafeWork NSW inspectors visited 286 sites where rooftop solar was being installed, with 84% of these sites being categorised as residential. 12% were commercial sites and 4% were 'other' (e.g., offices, sheds, workshops). One infrastructure site was also visited.

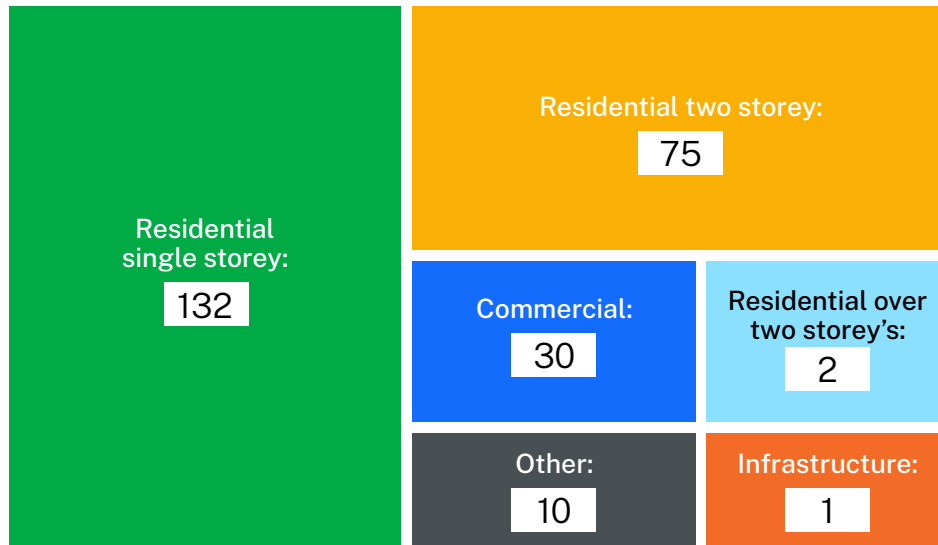
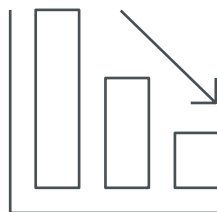


Table 1: Type of site visited as part of the Solar Installation project between 26/02/2021 -31/12/2021.

Notices and fines



\$123,984



98

Improvement



123

Prohibitions



39

Penalties

Inspectors issued 260 notices during the visits, including 98 improvement notices, 123 prohibition “stop-work” notices and 39 penalties totalling \$123,984. Most notices and fines were issued for falls from heights risks.

Inspector observations

Inspectors completed a safety checklist on all sites, covering predominantly safety planning, falls and electrical risks. Inspectors provided advice and assistance where required and addressed any other safety risks as observed.

Their observations are listed below.

Planning for Safety

17% of sites did not have a safe work method statement (SWMS) for high-risk construction work (e.g., where there was a risk of a person falling more than 2 metres, electrical work, asbestos).

Of the sites that had a SWMS, **28%** of the SWMS were not adequate.

Of the sites that had a SWMS, **46%** were not following the safety controls in the SWMS.



Falling objects

46% of sites had no exclusion zone established around the work area to prevent the public or others being hit by objects that may fall off the roof.

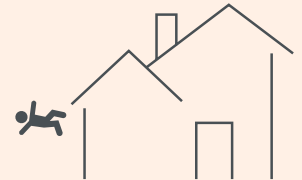


Falls from heights

24% of sites did not have safe access/egress to the roof.

26% of sites did not have the ladder set up safely e.g., not fixed at the top and/or not extending 1-metre past access point.

47% of sites did not have adequate controls in place to prevent a fall through brittle/ fragile roof materials (e.g., no covers over skylights, no roof mesh, no physical exclusion zones, etc).



The below table lists the fall protection that was in place at each site. Generally, scaffold and roof edge protection are a higher order (and safer) control when it comes to roof work. Harnesses should only be used as a last resort, if installing scaffold or roof rails is not possible due to the roof design or site.

4% of sites used scaffold, 24% used roof rails, 42% used harnesses and **27%** used no falls controls at all.

Type of fall protection implemented for roof work

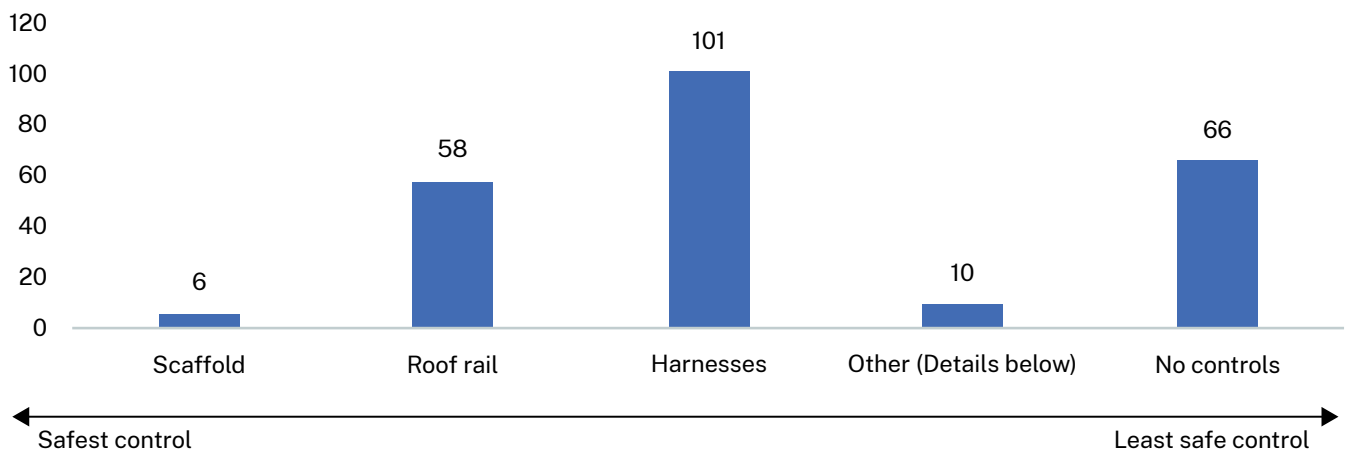


Table 2: Fall protection observed in the Solar Installation project between 26/02/2021 - 31/12/2021.

The “other” controls in the above table included bollard/flag system, no-go zone etc.

47% of controls in place were not properly installed or implemented, and so workers were not protected.

The breakdown of the percentage of controls that were not installed or implemented safely is in the table below.

Were the controls in place being used safely?

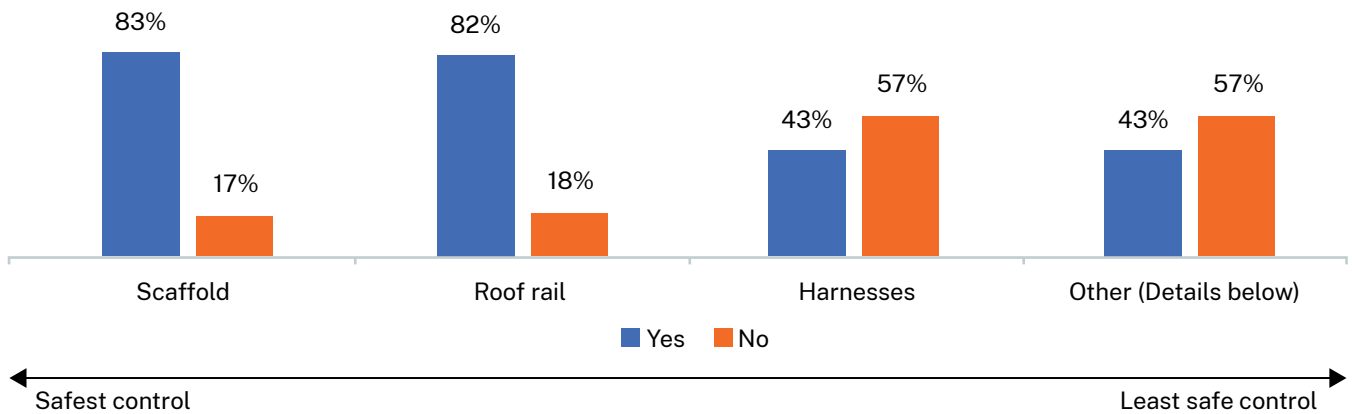


Table 3: Percentage of controls being used safely in the Solar Installation project between 26/02/2021 - 31/12/2021.

Installers were asked:

“If roof rails or scaffold are NOT in place, why have you not implemented that control?”

Excuse	% of sites
Didn't know or wasn't aware	29%
Cost	13%
Building structure or no eaves	13%
Available but not used	11%
On order	11%
Company doesn't have enough	10%
Complacency	6%
Chose to use harnesses	4%
Flat roof - thought it was okay	2%

Table 4: Solar rooftop installers excuses as to why they did not have the higher order controls of scaffold or roof rails in place as part of the Solar Installation project between 26/02/2021 - 31/12/2021.

Residential single vs. double (or higher) storey fall protection

We separated the type of fall protection in place for a single storey vs a double storey (plus) residential building. Whilst most serious and fatal falls are generally from less than 4 metres high, which is about a single storey, it is surprising that there was no fall protection in place for **25%** of single storey and **43%** of double storey.

Single vs. Double Storey Falls Protection

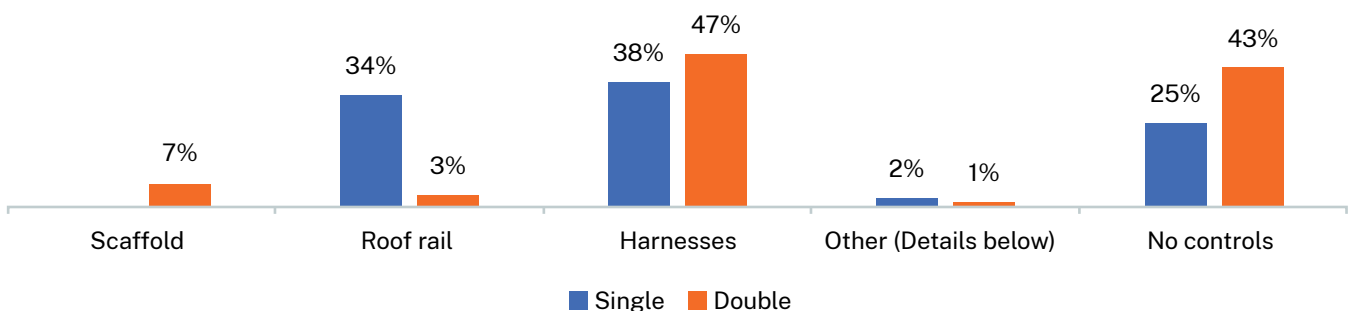


Table 5: Single vs. Double Storey falls protection analysis for the Solar Installation project between 26/02/2021 - 31/12/2021.

Spotlight on harness use

When we looked at the 43% of sites that were using harnesses as their highest order control, inspectors observed a high percentage of users who did not set up their system safely.

Additionally, inspectors observed that **50%** of harness users were not actually connected to anything.

These observations are in contradiction to the evidence collected by inspectors indicating that 83% of workers had received adequate training for the harness system used (or working at heights). The high percentage of unsafe set-up and use indicates that either industry training is inadequate, or that users are knowingly mis-using harnesses.



Harness Safety – inspector site observations	Yes	No
There is a plan/diagram that shows the system layout e.g., anchor placement etc	35%	65%
The system allows the worker to connect onto the system prior to exiting the ladder	49%	51%
The system prevents the worker from reaching a fall hazard when correctly adjusted	59%	41%
Proprietary anchors points are installed in accordance with the manufacturer’s instructions	68%	32%
Improvised anchors (rafters, beams) have been assessed by a competent person and appear structurally adequate to withstand load	61%	39%
Users are installing multiple anchors to cover the working area	45%	55%
The anchors, shock absorbing lanyards, harness, rope grab, static line are fall arrest rated	85%	15%
If using fall arrest, the installer has ensured enough clear space to prevent impact	44%	56%
The workers are wearing the harness correctly	77%	23%
If harness(es) is/are being used, the workers are connected to the system	50%	50%
Workers are adequately trained in the use of the fall restraint or fall arrest system	83%	17%

Table 6: Inspector safety observations related to harness set-up and use – percentage of sites with an answer of “yes” or “no” for each checklist question -in the Solar Installation project between 26/02/2021 -31/12/2021.

Electrical safety

When it came to electrical safety, inspectors generally observed higher levels of compliance and safety, with the exception being distance to overhead powerlines and lock out/tag out (LOTO) procedures.

High compliance rates

98% of sites had electrical work being conducted or appropriately supervised by a licenced electrician.

96% of sites where workers were entering a ceiling space or drilling into walls, had the electricity switched off at the meter box.

97% of sites had authorised electrical workers testing for dead to ensure the power was isolated prior to conducting electrical work.



Controlling the risks associated with mains and isolators

97% of sites with energised consumer mains prior to the meter box had adequate controls in place.

100% of site had solar panel isolators terminated prior to panel installation.

100% of sites had the DC isolator sealed to prevent water entering.

14% of sites did not have the risks associated with overhead powerlines adequately controlled.

28% of sites did not have a lock placed on the main switch or the meter box itself, eg. no lock out/tag out (LOTO) procedure.



Recommendations

Falls from heights remains the number one cause of traumatic fatalities on NSW construction sites, with most serious and fatal falls being from roofs, ladders or non-compliant scaffolds, and from 4 metres or less.

Rooftop solar panel installation is continuing to see high growth in NSW, in part due to the NSW and Federal government installation rebates on offer.

Solar retailers and installers have duties under work health and safety laws to ensure workers are safe when installing rooftop solar panels.

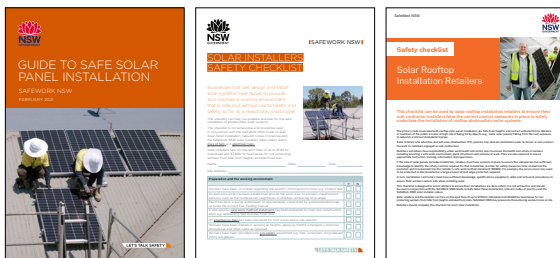
It is clear from the inspector observations in this report, that workers in the rooftop solar panel installation industry are at high-risk of serious or fatal incidents due to the recurrence of no or inadequate fall protection in place.

Additionally, the reliance of harnesses for fall protection continues to place workers lives at risk due to the high proportion of systems that are either set up incorrectly or not being used safely. Industry must continue to lift its standards in relation to using higher level fall protection, such as roof rails and scaffolds, opposed to harnesses.

SafeWork will continue to target safe solar rooftop installation as part of its Building and Construction Sector Work Health and Safety Plan, and recommends a review of current codes of practice and regulator guidance around safe work on roofs, including harness use.

Where to get more help?

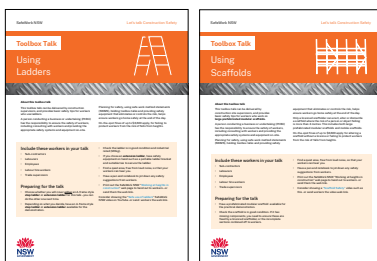
Solar rooftop safety guidance:



Codes of practice



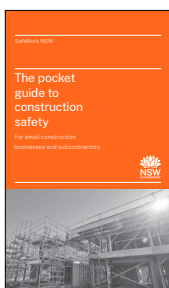
Hold one of our toolbox talks:



Refer to our roof edge protection fact sheet:



Download the pocket guide or order your hard copy version:



Listen to a podcast:



Disclaimer

This publication may contain information about the regulation and enforcement of work health and safety in NSW. It may include some of your obligations under some of the legislation that SafeWork NSW administers. To ensure you comply with your legal obligations you must refer to the appropriate legislation.

Information on the latest laws can be checked by visiting the NSW legislation website

www.legislation.nsw.gov.au

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