

## Technical solution sheet 3

# Manual handling of solar panels, heavy and bulky items



### What is hazardous manual handling?

Manual handling is work such as manually lifting, lowering, pushing, pulling, carrying, moving or holding solar panels and other heavy and bulky items.

During solar installations, injuries can occur while undertaking hazardous manual handling that often involves:

- » repeated, sustained, or high force
- » sustained awkward postures
- » repetitive movements
- » loads that are unstable, unbalanced or hard to hold.

### Potential for injuries

Employees who are manually handling solar panels and the components that form the photovoltaic (PV) system can be injured by overbalancing, tripping and falling from a roof or ladder, or by being struck by falling objects.

Manual handling can also expose workers to harm to their musculoskeletal system and can cause injuries known as musculoskeletal disorders (MSDs).

These include:

- » sprains and strains
- » back injuries
- » hernias
- » chronic pain
- » cuts and broken bones.

A risk assessment should be carried out prior to handling solar panels. This should identify any manual tasks related to the installation of the PV system that could be hazardous.

Follow this four-step risk management process to ensure hazards are identified, risks are assessed and controlled, and that employers fulfil their duty to monitor, review, and revise controls when required:

**Figure 1:** The four-step risk management process



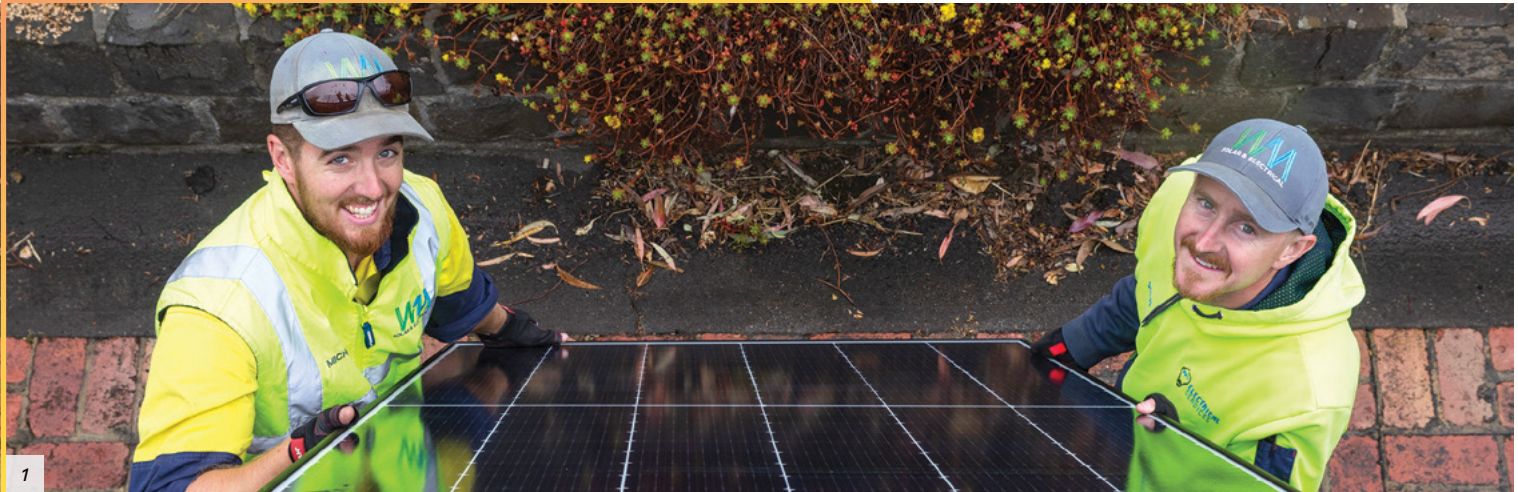
**This is part of a series developed with WorkSafe to help installers in our programs work safely in the solar industry.**

Use this sheet and others in this series to plan safe systems of work while installing photovoltaic systems.

#### In series 1:

- 1.1 Working safely at height during solar installations
- 1.2 Edge protection – Working at height
- 1.3 Manual handling of solar panels, heavy and bulky items (this sheet)**
- 1.4 Working safely with ladders
- 1.5 Safe work practices using elevating work platforms
- 1.6 Falls through skylights, fragile roofs, voids and penetrations
- 1.7 Working near asbestos-containing material

See: [solar.vic.gov.au/safety-and-quality](http://solar.vic.gov.au/safety-and-quality)



### Step 1: Identify hazards – what manual handling work can be hazardous?

Not all manual handling work is hazardous. Employers have a duty to identify, so far as is reasonably practicable, and in consultation with employees, any work that involves hazardous manual handling.

Hazard identification is the first step in assessing workplace tasks to determine if they pose a MSD risk to employees.

During the installation of PV systems, employees may be exposed to several hazardous manual handling tasks that can lead to MSDs. These include:

- » lifting PV panels or other heavy items above shoulder height which may have risk factors of strains, sprains and back injuries
- » working overhead to install and secure a PV module to its support frame or tracking system, which may have risk factors of awkward postures, repetitive or sustained forces and exposure to vibration from using power tools
- » manual handling of heavy or bulky materials onto a roof during the installation process, which may have risk factors of slips, trips and falls.

### Step 2: Assess risks – when does manual handling become more hazardous?

Once the hazards have been identified, and in consultation with employees, assess the MSD risk posed to employees undertaking manual handling tasks.

Forces, postures, movements, and vibration can impact each other to increase the risk of injury. For example, it takes more bending and twisting of the back to pick up a solar panel from the floor than from a bench at mid-thigh height. The more sustained the task, the greater the risk of injury. Environmental factors like heat, cold and lighting levels can also increase the risk of injury.

Work-related stress can also be a factor in the development of MSDs. For example, high pressure and a perceived lack of support can contribute to poor outcomes in managing and treating MSDs.

All of these factors can also be exacerbated by an employee's physical condition and attributes, age, and the existence of any prior injuries.

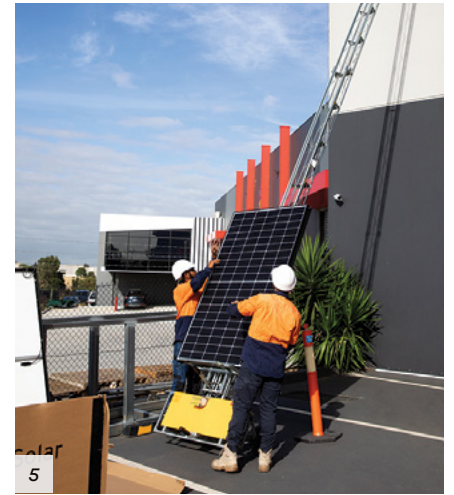


Image captions:

1. Use two or more people to help lift heavy loads (team lift).
2. Solar panels, materials and tools must be suitably located to minimize the amount of carrying required.
3. Lift and carry heavy loads properly, keep the load close to the body and lift with the legs, not the back.
4. Solar panels should be passed through the middle rail gap to avoid awkward positions and overreaching.
5. A Solar Panel Lifter is a conveyor system that provides a fast, safe and efficient way of getting solar panels from the ground to the roof.
6. Elevating Work Platforms (EWP) such as scissor lifts can provide a boost to productivity and safety while installing solar panels on houses and industrial sites.



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### Step 3: Control risks – how can you control the risk of MSD?

To control the risk of MSD, set out specified risk control measures and commit to using them when undertaking hazardous manual handling.

Ensure relevant information based on the risk assessment is included in a safe work method statement (SWMS) when required.

See the WorkSafe website for more information on when and how to complete a SWMS for construction activities: [worksafe.vic.gov.au/resources/safe-work-method-statements-swms](https://www.worksafe.vic.gov.au/resources/safe-work-method-statements-swms)

The hierarchy of control is the best risk management tool for controlling risks in the workplace. Chapter 3 of the Occupational Health and Safety Regulations 2017 (OHS Regulations) stipulates an employer’s duties with respect to hazardous manual handling and includes the specific hierarchy for controlling MSD risk.

The hierarchy must be applied at the highest level of control so far as is reasonably practicable before considering the level below. In some cases it will be necessary to use a combination of risk control measures to effectively control risk.

For more information see the WorkSafe Hazardous Manual Handling Compliance Code: [worksafe.vic.gov.au/resources/compliance-code-hazardous-manual-handling](https://www.worksafe.vic.gov.au/resources/compliance-code-hazardous-manual-handling)

Table 1 Hierarchy of control for controlling the risk of MSD associated with hazardous manual handling.

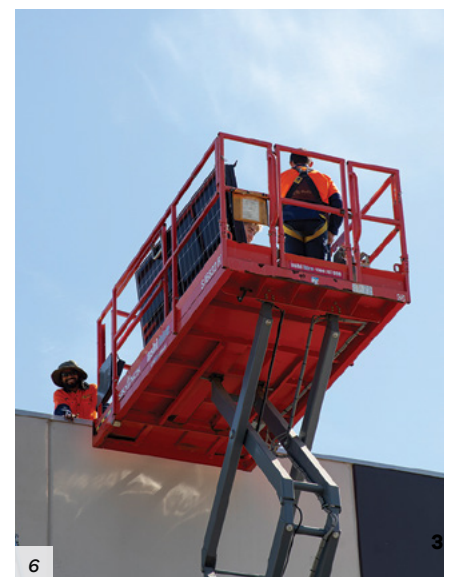
Control level	Description	Example
1	<b>Eliminate the risk of MSD</b>	Remove the activity that carries any risk of MSD
2	<b>Reduce the risk of MSD by introducing changes to the workplace or work</b>	Create changes to: <ul style="list-style-type: none"> <li>» workplace layout or environment</li> <li>» systems of work (consider mechanical aids)</li> <li>» devices used in hazardous manual handling</li> </ul>
3	<b>Reduce the risk of MSD through administrative and management controls</b>	Ensure appropriate provision, use and understanding of: <ul style="list-style-type: none"> <li>» information</li> <li>» instruction</li> <li>» training</li> </ul>

### Step 4: Review and revise controls

Control measures are more effective where there is regular review of work procedures to make sure they are working as planned. An employer must review and, if needed revise them:

- » before changes are made to a thing, process or systems of work that involve manual handling
- » when you become aware of new information about hazardous manual handling including new and improved control methodology or equipment
- » if an injury is reported, or a notifiable incident occurs
- » if for any reason, the risk control measures fail to adequately control the risk
- » if a Health and Safety Representative requests a review and/or revision of a control.

Your actions shouldn't stop at Step 4. You should repeat this process often to make sure your risk management controls are working.



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## Important resources

See the WorkSafe website for:

- » Compliance code - Hazardous manual handling:  
[worksafe.vic.gov.au/resources/compliance-code-hazardous-manual-handling](https://worksafe.vic.gov.au/resources/compliance-code-hazardous-manual-handling)
- » Hazardous manual handling information:  
[worksafe.vic.gov.au/hazardous-manual-handling](https://worksafe.vic.gov.au/hazardous-manual-handling)
- » Safe work method statements (SWMS):  
[worksafe.vic.gov.au/resources/safe-work-method-statements-swms](https://worksafe.vic.gov.au/resources/safe-work-method-statements-swms)

Also see:

- » Occupational Health and Safety Regulations 2017 (OHS Regulations):  
[legislation.vic.gov.au/in-force/statutory-rules/occupational-health-and-safety-regulations-2017](https://legislation.vic.gov.au/in-force/statutory-rules/occupational-health-and-safety-regulations-2017)

## Any questions?

Call WorkSafe on 1800 136 089 or email [info@worksafe.vic.gov.au](mailto:info@worksafe.vic.gov.au)

[worksafe.vic.gov.au](https://worksafe.vic.gov.au)

For more information about Solar Victoria's commitment to safety and quality, including training and workforce development, see: [solar.vic.gov.au/industry](https://solar.vic.gov.au/industry)

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