

# Photovoltaic Installations (PV)

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This document was prepared by the Environment and Sustainable Development Directorate (ESDD) to assist electricians in understanding the compliance issues raised in Electrical Note 6.

## Compliance issue

Running the d.c. wiring system from a PV Panel to under the roof by going between two roof tiles is prohibited by Clause 3.9.4.3.1 of AS/NZS 3000:2007 (known as the Wiring Rules)

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### AS/NZS 3000:2007

#### 3.9.4.3.1 Prohibited locations

**Wiring systems** shall not be installed through any space formed between roofing or wall-lining material and its immediate supporting member (see Figure 3.6).

NOTE: Examples of these situations include those between tile battens and roofing tiles or between corrugated (or other profile) sheeting of a wall or roof and its supporting members are shown in Figures 3.6 and 3.7. (Clauses 3.9.4.1 and 3.9.4.3.2)

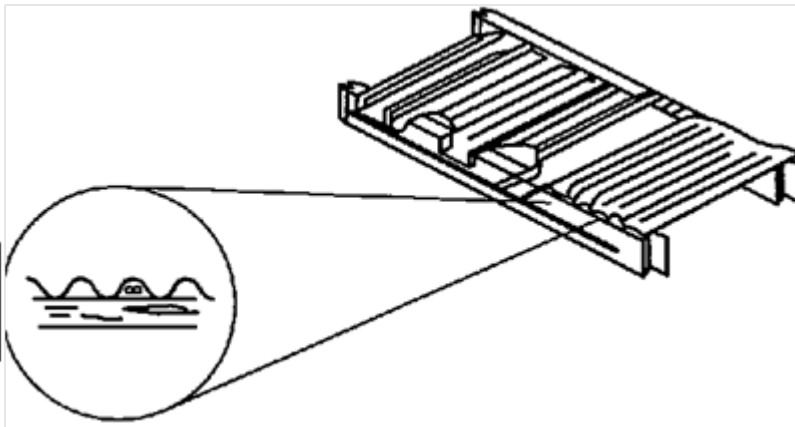


FIGURE 3.6 PROHIBITED CABLE LOCATION-ROOF OR WALL-LINING MATERIALS

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## Comments

- The figure 3.6 is a poor drawing and only relates to an example in the rule note. It does not make the rule it is just illustrating a point. We need to look at the wording of the clause for the rule.
- From this clause we look at the first two words - **Wiring systems**

What is a **Wiring system**? We look at Clause 3.2 of AS/NZS 3000:2007

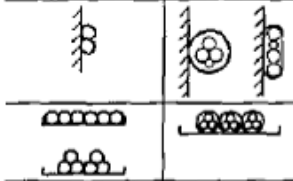


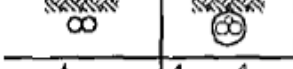
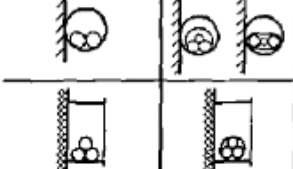

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**3.2 TYPES OF WIRING SYSTEMS**

The type of wiring system and method of installation used shall either

- (a) comply with Table 3.1; or
- (b) have a degree of safety equivalent to that given in Table 3.1 and comply with the requirements of this Section.

**TABLE 3.1  
CABLE TYPES AND THEIR APPLICATION IN WIRING SYSTEMS**

Installation method	Description	Typical cable types
	On a surface (including cable tray or ladder)	Insulated and sheathed Screened or armoured Mineral insulated, metal sheathed (MIMS) Earthing conductors
	On a surface partly surrounded by thermal insulation	
	Fully surrounded by thermal insulation	
	Buried direct in the ground, subject to the requirements of Clause 3.11	
	In an enclosure	Insulated, unsheathed insulated and sheathed Screened or armoured MIMS Earthing conductors
	On a surface (including cable trunking)	

**Comments**

From this clause and table we clearly see that a cable in a conduit is a **Wiring System**.

We return to the clause: ***“shall not be installed through any space formed between roofing and its immediate supporting member”*** (removed “or wall-lining material” as we are dealing with a roof only)

A conduit under a tile is between roofing and its immediate supporting member.

**Therefore the practice of running the wiring between two tiles is not allowed by Clause 3.9.4.3.1 of AS/NZS 3000:2007**

### ***General warning and note.***

Further to this argument is the fact that the installer is admitting he is deforming a roof tile. Advice from the ESDD Registrar of Construction Occupations is that this practice maybe in breach of the Building Code of Australia (BCA) and as a result the installation of a PV system on a Class 1 structure would no longer be exempt from requiring a Building Approval. See examples below.

Electricians need to be aware that altering a building structure may be contrary to BCA requirements and consultation/approval with a Building Certifier is recommended.

Further advice on this subject is available in Electrical Note 6 from our website at:

[http://www.actpla.act.gov.au/customer\\_information/industry/industry\\_groups/electricians\\_information](http://www.actpla.act.gov.au/customer_information/industry/industry_groups/electricians_information)

Other examples where the BCA has requirements that the Wiring Rules do not cover:

- The BCA has energy efficiency requirements for residential installations. The Wiring Rules do not go into how many watts per square metre you can have, but the BCA does.
- The practice of running a cable in the wall cavity of a brick veneer house by electricians, may be allowed in the Wiring Rules, but the BCA has restrictions on this method due to water transfer from the bricks to the wood structure.

## **Exemption**

The ESDD Registrar of Construction Services has approved a limited number of installations where the installer has made every effort to comply with the rules and these are approved on case by case bases.

Installations done prior to 1 December 2011 using the following method shown will be approved by the ESDD Electrical Inspector. (See Electrical Note 6)





The PV installation is then placed over the conduit and tile, so a PV panel covering this will prevent any object from putting pressure on the tile.

Must be **sleeved** corrugated conduit or rigid conduit.

Un-sleeved corrugated conduit will not last the lifetime of the installation.



## Examples of prohibited method.



Tile is placing pressure on conduit

Conduit is not sleeved.



Conduit is not sleeved

Tile is exposed and likely to have pressure placed on the tile as it is not under a PV panel

Also, repairs to conduit not allowed this way and warning labels are not UV stable and have faded.

Ensure enclosure is mounted as per manufactures instructions to avoid water ingress.

## Example of approved method

The following is an example of an acceptable method. You are not limited to this system, we are just illustrating an example of an acceptable method.



Conduit is sleeved

Approved conduit adaptors used

Conduit saddles should be installed to retain conduit.

Note array in background; Each array has its own isolator, and a isolator has been installed where a wiring systems enters the roof space.



If further information is required, please contact the ESDD Electrical Inspectors;  
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