



Eaves in Canberra

Introduction

Eaves help shelter walls from the sun and rain. To protect walls from rain, eaves with a minimum width of 400 to 600mm are recommended on all walls. However during winter we welcome sun falling on our walls, while in the summer we generally want to exclude sun to make the indoor environment more comfortable. In addition, the sun's position in the sky varies both during the day and seasonally.

The size of northern eaves is of particular importance as the potential for solar gain in winter in Canberra is considerable and the wrong eave can result in a dramatic decline in energy efficiency of a house.

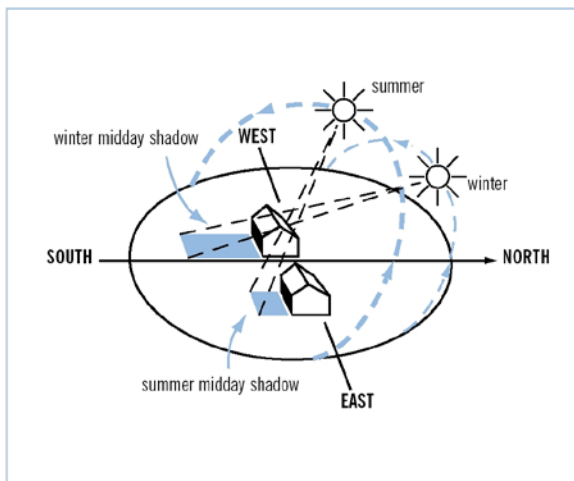
The bulk of this fact sheet addresses designing eaves for optimal sun performance.

Southern eaves

On the south of your home eaves provide protection from Canberra's harsh south-westerly winter weather.

Therefore eaves and plantings on the south will assist in reducing the effect of cold wind and rain on the southern walls.

Direct sunlight does not touch southern windows at all in winter and barely touches them in the height of summer; so southern eaves offer little solar loss.



East and West: eaves are not enough

On the east and west of your home, particularly the west, eaves alone will not adequately protect windows from excess heat gain.

In summer, the western sun in the late afternoon strikes the house close to horizontally, coming in under the eaves.

Reducing windows to the bare minimum on the east and west and incorporating movable **vertical** elements outside the windows that block the sun from reaching the glass provide the best solution on western and eastern walls.

Some solutions include: sails, blinds, shutters and deciduous trees. While it is important to block the sun in summer, such sun is welcome in winter so east/west shading should be seasonably adjustable.

Northern eaves

Eaves on this side of the home are often called 'solar eaves'.

On the shortest day of the year, the winter solstice, June 21st, the **HIGHEST** the sun rises (the altitude angle) on the north of your home is 31 degrees off the ground.

The sun rises at 60 degrees east of north and sets at 60 degrees west of north, effectively shining all day on northern walls.

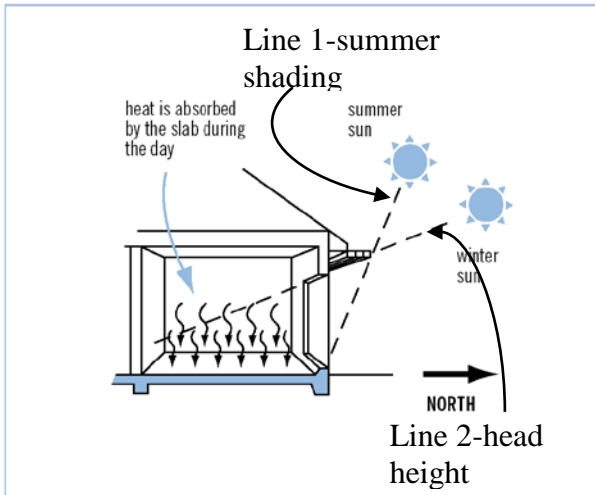
On the summer solstice (December 21st), the longest day of the year, the sun spends most of its time at or above 50 degrees off the ground when shining on north facing walls.

It rises at 120 degrees east of north and sets at 120 degrees to the west. The change in the sun's position over the year, means that facing a house due north, minimising windows to the east and west, and maximising them to the north lets in winter sun while blocking most of the summer sun.

To let in the maximum possible sun in winter, **NO** eaves would be good on the north of your home, conversely in summer some eave would assist in



blocking excess heat gain, particularly in late January and February when the sun's angle is lower. Hence the perfect eave for the north of a home in Canberra would be a retractable or removable eave, one that could completely block out direct summer radiation and fully allow winter gain.



Working out a compromise

As retractable or removable eaves are not standard building structures, a 'solar compromise eave' width can be determined – one that blocks out most excess summer heat and lets in most winter gain.

On 22 February and 21 October the noon sun angle on the north drops to 65 degrees off the ground. Most days between these dates are warm enough that we don't require additional solar gain. So a line drawn up from the base of the window at a 60-65 degree angle will provide an eave wide enough to block out summer sun (line 1).

Another line then drawn at 25-30 degrees from the underside of the eaves back to the wall will provide the maximum head height of the window. This window head height minimises the heat loss out of the window through the upper area of the wall/window, while still letting in most winter sun (line 2).

For most homes with fairly standard ceiling heights and window sizes this results in an eave on the north of 600-900mm. Don't forget to include the width of your gutter in the calculations.

In autumn and spring, when the sun's noon angle is about half way between its summer and winter positions, you may wish your eaves were slightly longer or slightly shorter. Again some form of retractable eave would provide a more controllable solution.

Finally it is worth noting that as your northerly walls get further from facing due north, they may require additional external shading

More information

This fact sheet is produced by the Home Energy Advice Team (HEAT) to provide you with some quick tips on eave sizing. If you would like more free information about this or any other topic to do with saving energy in your home, don't hesitate to contact us:



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