Setting out —
and getting it right

This is the first in a series that will focus on the building process from the ground up, as a refresher. Here we tackle site set-out. Try the quiz at the end to see how much you already know.

Before excavating for foundations, forming building platforms or removing topsoil to cleared ground level, the proposed building must be 'set out'. This involves working out the location and relative height and size of the building on site. There are two key steps.

Finding reference points

First off you need to establish the boundaries and roughly where the building sits. Start by finding the boundary pegs and decide on a reference point for the set-out. Then establish a datum point, or locate one referenced on the plans, for setting out the height of the building in relation to the ground or other features.

Before removing topsoil, forming a building platform or starting to dig for the building foundations and services, check for the presence of live or redundant cables, sewers, water or gas pipes. This information will normally be available from the PIM.

Once the building platform has been formed and the position and relative levels of the building have been established, the set-out of the building can be accurately carried out.

Setting out profiles

Erect profiles approximately 1.2 m (but not less than 0.9 m) outside the perimeter of the building. Brace the profiles to keep them from moving. (See Figure 1.)

Starting with the longest building face, locate each corner and then set out lines at right angles from this line to locate the other lines.

Check to ensure the building layout is square by measuring the diagonals and using the 3-4-5 rule.
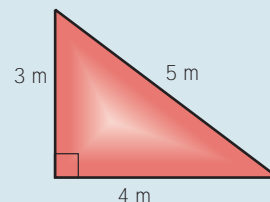
Level the horizontal profile batter boards from the highest point on the site first, using a builder's or laser level (the top is often set at the floor or top of foundation level). Then check to ensure that minimum heights and ground clearances will be achieved.

Mark set-out lines on the levelled profiles and run string lines from profile to profile to give an exact set-out.

If the site conditions are suspect, the site should be inspected by a registered engineer. This inspection will determine the soil conditions and whether foundations to NZS 3604 can be used or whether they need to be specifically designed.

More information on setting out is given in BUILD *Dec 03/Jan 04, page 22, Feb/March 04, pages 13–15, and in the* BRANZ *House building guide.* »

The 3-4-5 triangle rule

The ancient Egyptians originally discovered the 3-4-5 rule and then a Greek mathematician called Euclid, who lived in Alexandria about 300 BC, developed proofs of it.

The rule is that if a triangle's sides are 3, 4 and 5 units long, the angle opposite the longest side will always be a right angle (90°).

When measuring out on site, the larger the sides of the triangles, the more accurate your check is likely to be. Just make sure the units you use are multiples of 3-4-5, eg 6, 8, 10.

3 m   5 m

4 m

| *The 3-4-5 rule.*

Boundary pegs

Boundary pegs have a long and important history. They define the exact position of a section and may be used for setting out buildings. It stands to reason that pegs must be accurately placed if a building is not to encroach.

Boundary pegs have changed little over the years, usually white-painted totara with a bevelled top. Under the Cadastral Survey Act 2002, the standard peg must be no less than 500 mm long and 50 mm wide, with a minimum cross-section of 3,500 mm^2.

They are driven so as to stand slightly higher than the surrounding ground level. Variations are allowed, as described in the Act.

The positions of boundary pegs are shown on survey plans at each corner of a lot. If the pegs are not present, a registered surveyor will have to relocate them. Each peg is marked to show which lot it relates to, with the centre point taken as the boundary line. »
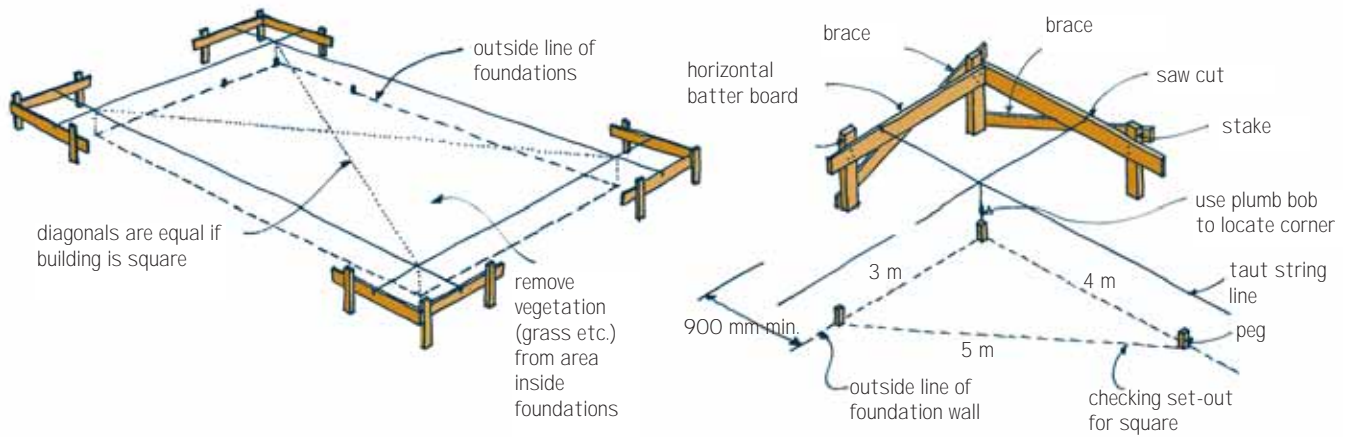
Figure 1: Once profiles are constructed, check for square using the 3-4-5 rule and set out your building.

Doing the
calculations

It always pays to double-check when setting out.

Site coverage means working out areas, and the rules of thumb here are length × width for rectangular shapes and half the base × height for triangles. Try working out the percentage site coverage of the building shown at right. (The answers are given on page 37.)