Support Article:

True North Versus Magnetic North

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So you are standing on the site with your trusty compass which is pointing North....but is it? Your compass is showing you the direction of Magnetic North not True North. What's the difference and do we care?

Because the Earth is a great big magnet, your compass (also a magnet) points to Magnetic North which is somewhere in the wilds of the Canadian Arctic and is actually moving a very small amount from year to year.

True North indicates the point at the 'top' of the Earth where the rotational axis emerges. It is in the Arctic Ocean and is a fixed point.

So, what does this mean to us as designers and users of Revit?

There are two considerations:

- In Revit, you can create property lines by entering distance and direction in degrees into a table and then tag the property lines with the Revit tag tool. This information is usually sourced from survey drawings. For this article we'll call this Survey North.
- To produce accurate solar studies in Revit, you must ensure that you rotate the Revit True North to Solar North.

Solar North

This is fairly straightforward to understand. Think Sundial, and where the sun sits highest in the sky. Be aware that midday as per your clock is not necessarily the time of the sun's true zenith, as the earth is divided into time zones that average out true midday. In Brisbane for example, Solar Noon is approx 11:52am.

Survey North

You need to consider if North on your survey is representative of Magnetic North or True North. The surveyor can provide this information but as an initial check, look for reference to Meridian on your survey. If the Meridian is CAM (County Arbitrary Meridian) then the Survey North will be close to Magnetic North. Surveys of lots on a RP (Registered Plan) generally use the CAM and therefore Magnetic North.

More information can be found at:

http://www.nrm.qld.gov.au/museum/surveying_history/datum.html

The Meridian could also be AMG or MGA (Map Grid Australia) which likely indicates the survey was undertaken using GPS technology. In this case the Survey North is representative of True North.

Now we have a number of scenarios:

1. Survey North = True (Solar) North.

   In this case you would rotate Revit True North to True North. You would be able to tag your property lines successfully and your shadow studies would be accurate.

2. Survey North = Magnetic North.

   Which is by far the most common.

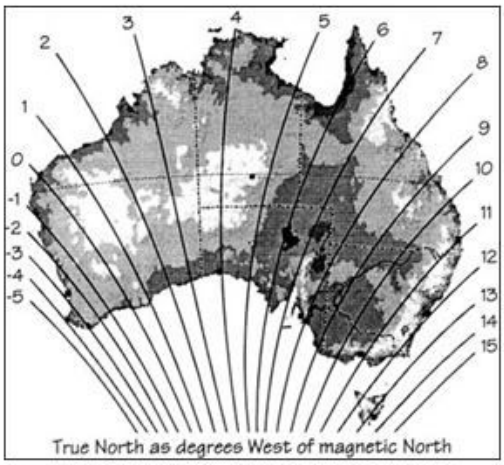
a) You don't require accurate shadow studies.

Rotate Revit True North to Magnetic North. The property lines will tag correctly but shadow studies will be a bit out. The extent of the inaccuracy will depend on the deviation between True and Magnetic North at the site.

b) You require accurate shadow studies.

To achieve accurate shadow studies Revit True North must be rotated to True (Solar) North not Magnetic North.

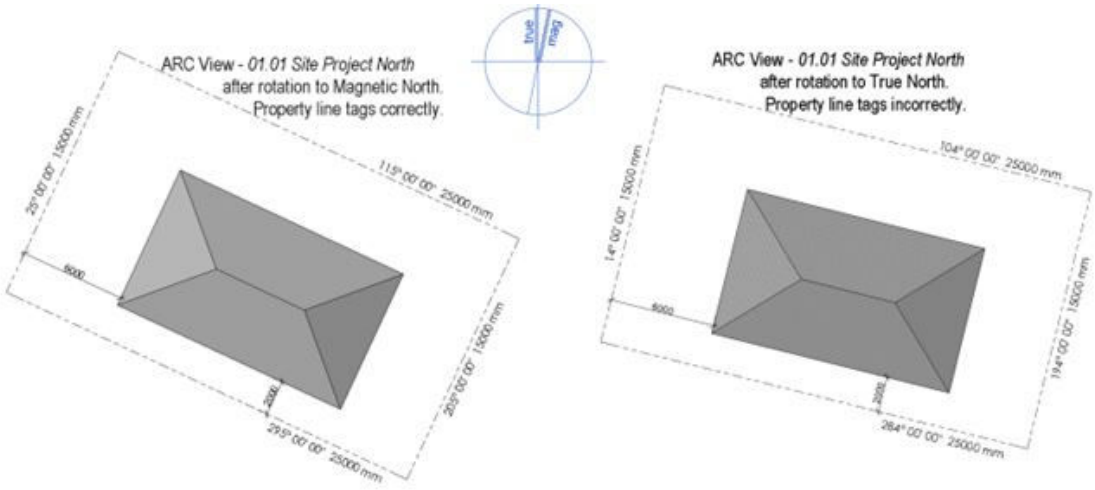
You can determine True North by adjusting Magnetic North for the deviation appropriate to the site.



Reference:
http://www.yourhome.gov.au/technical/fs43.html

As you can see the deviation varies considerably across Australia, from -4 to +14 .

Example: In Brisbane the deviation puts True North 11 West of Magnetic North.



Note that the property lines no longer tag correctly. The QARC Template System provides text labels to overcome this issue. Have a look at *Sheet 102SP - Site Plan 1-200*

For information on rotating your project from Project North to True North see the other articles.