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Determining a range danger area by manual application of an Ammunition Danger Area Template ADAT

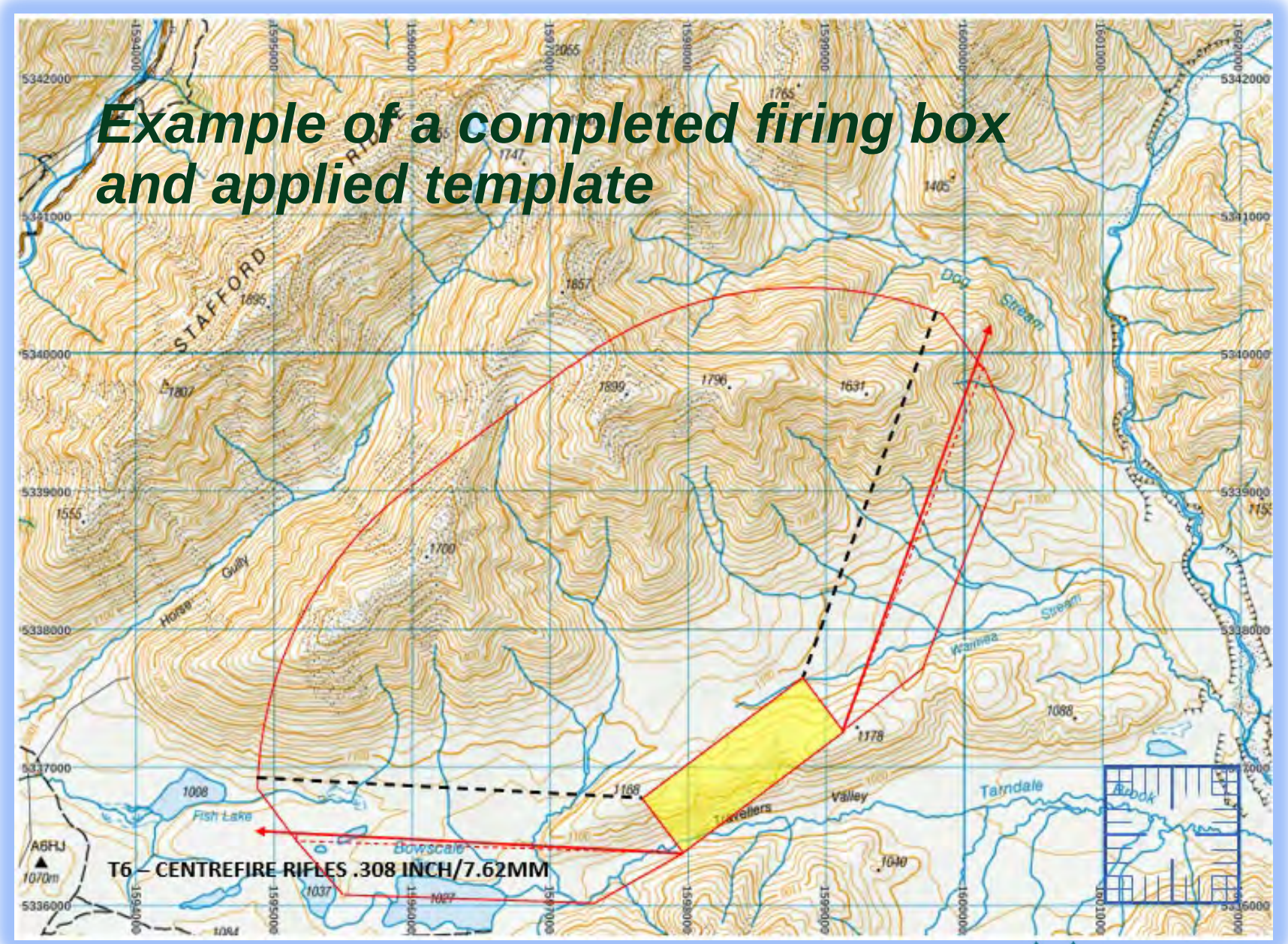
Template Application 3

Firing Box – with a left (LOA) and right (ROA) of arc

Introduction

- Grid location, dimensions and angle of the firing box
- Grid bearings (not magnetic) of Left of Arc (LOA) Right of Arc (ROA)

Example of a completed firing box and applied template



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Scenario
The SRO has planned a field shooting range with multiple firing locations with multiple targets. The shooter will be able to engage targets at various distances.

What is required?

- Topo map
- Grid location of at least one point for locating the firing box
- Direction of fire (range axis)
- Grid bearings of the left of arc (LOA) and right of arc (ROA)
- Size of the firing box (width and depth) This can also be expressed as 4 individual grid references
- Template to be applied (max calibre to be used)

Scenario
Below is the information required to apply the template

Information gathered from range site survey/ground recce

- Topo map – **BS25**
- Grid location - **E1597668, N5336773**
- Direction of fire (range axis) – **323^0**
- Size of the firing box – **1500m W X 500m D**
- Grid bearings – **LOA – 273^0 - ROA - 020^0**
- Template to be applied – **T6 (.308)**

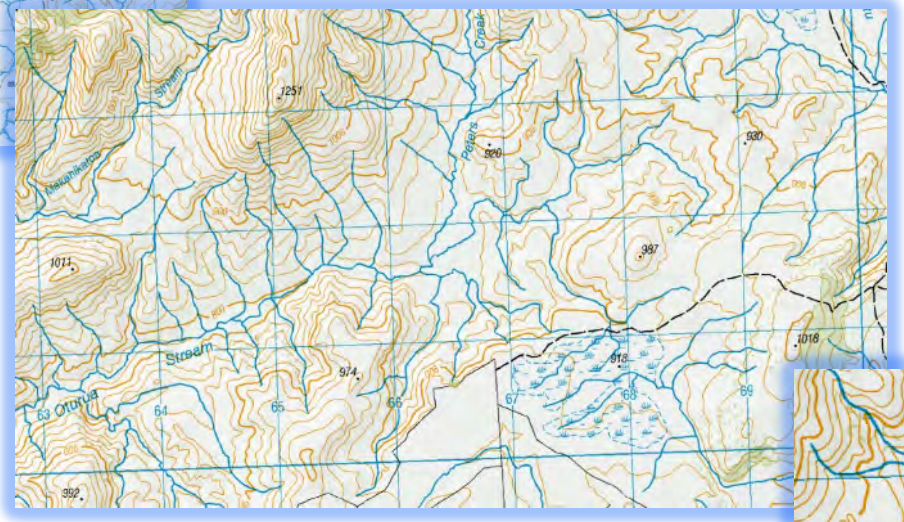
Getting the map onto your computer

- There are many websites you can use but for this example the free TopoMap NZ has been used

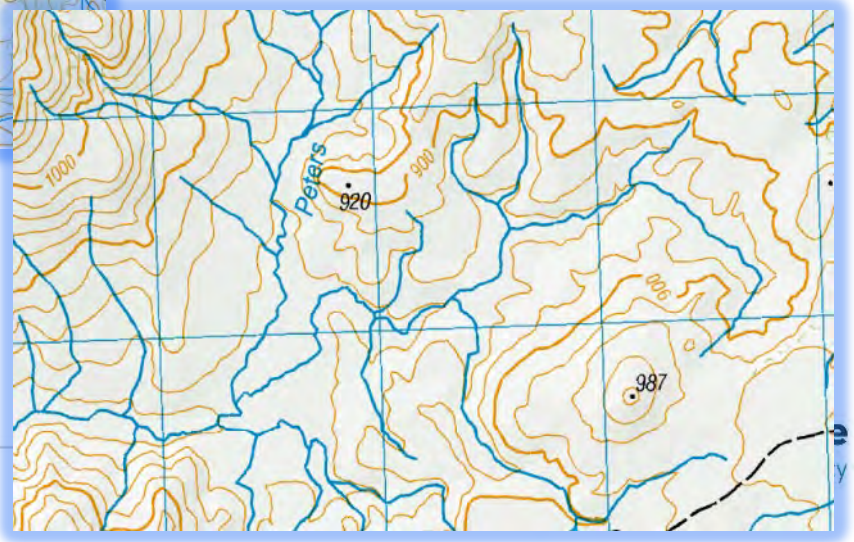
  https://www.topomap.co.nz/

- Find the location of your range and zoom in closer using the mouse wheel or the +/- buttons on the upper right hand side of the screen.

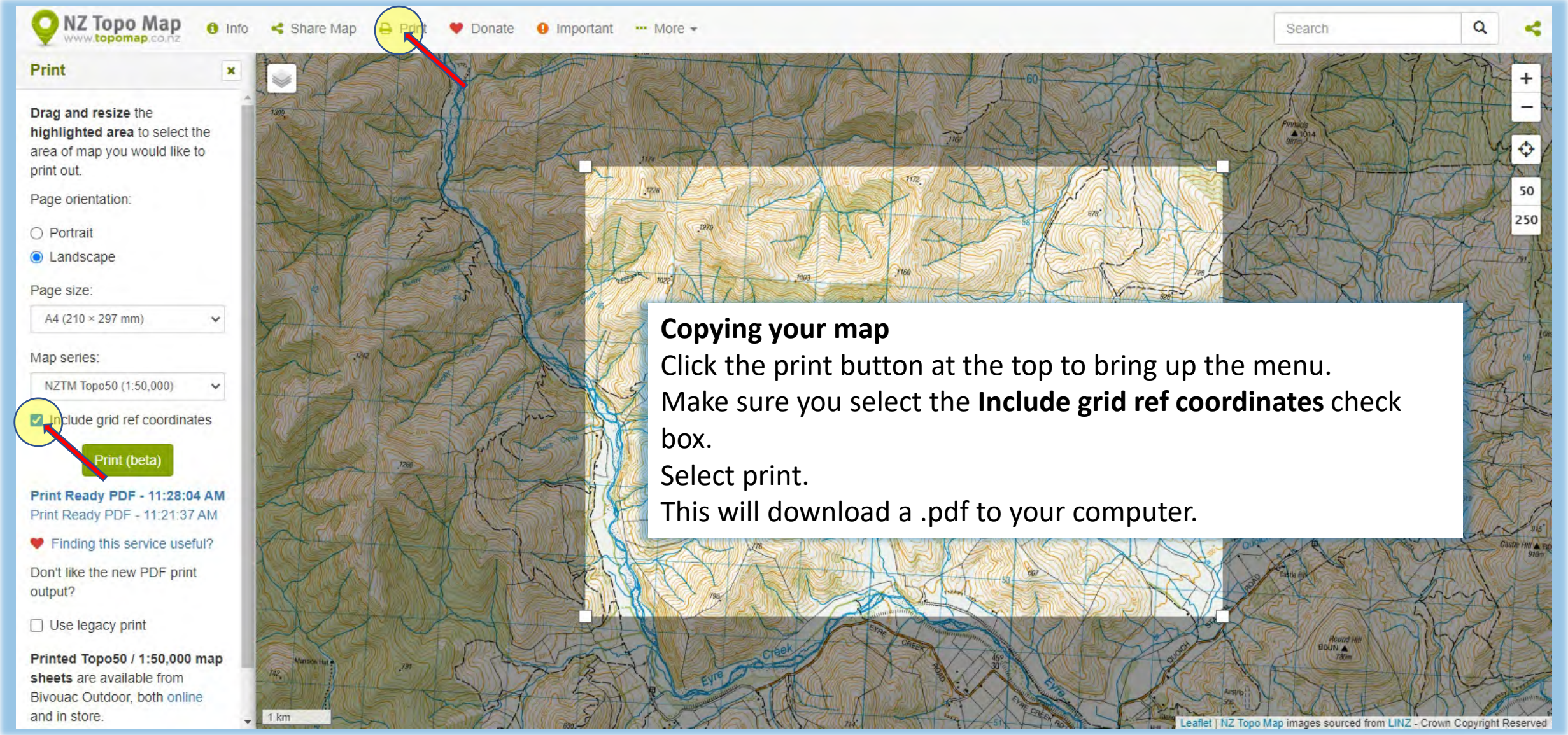
Zoom in to find the general location



Keep zooming to get closer



It will zoom in as far as it will go.
Next we need to copy that area of the map onto your computer.



Copying your map

Click the print button at the top to bring up the menu.

Make sure you select the **Include grid ref coordinates** check box.

Select print.

This will download a .pdf to your computer.

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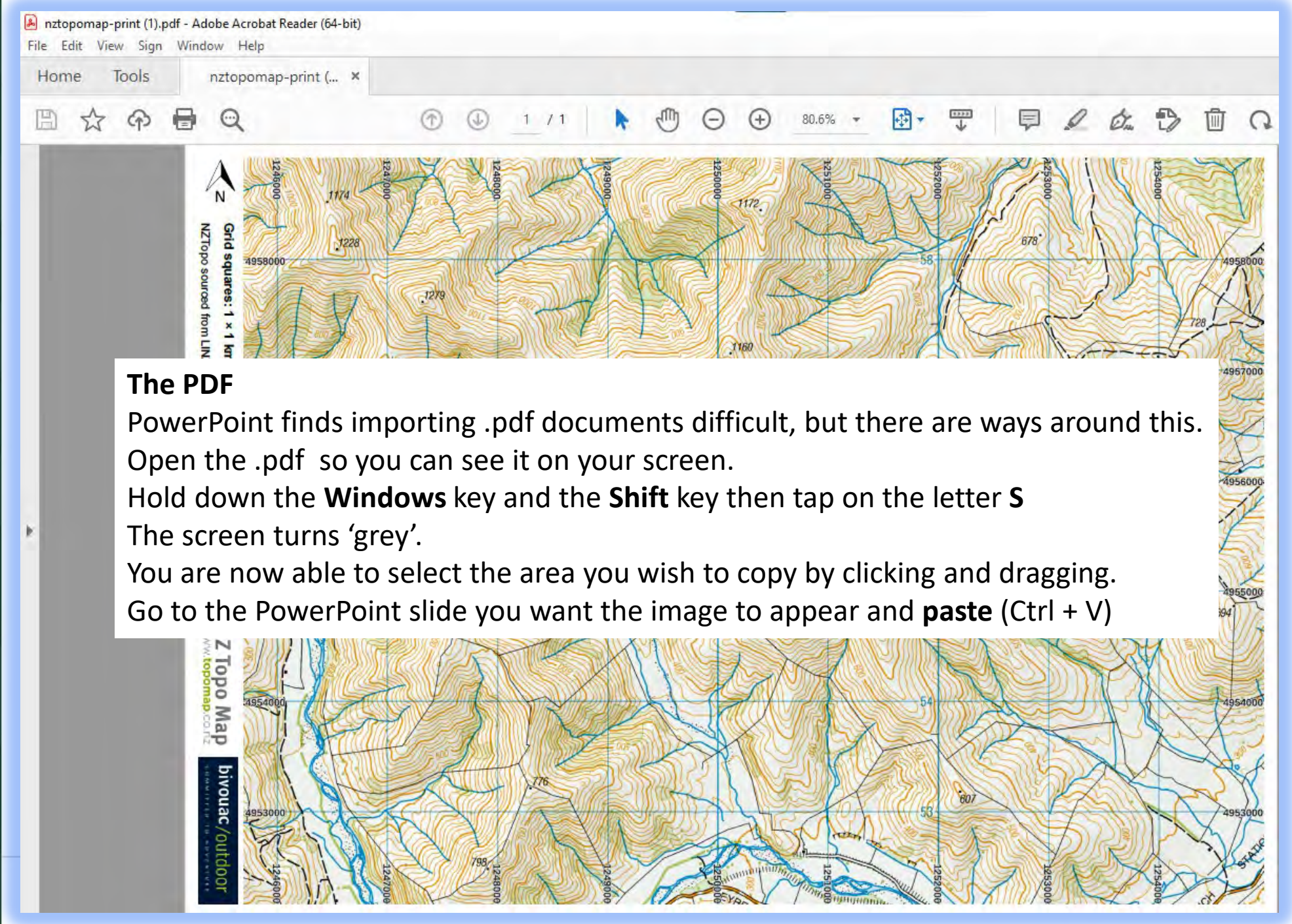


The PDF

PowerPoint finds importing .pdf documents difficult, but there are ways around this.

Open the .pdf so you can see it on your screen.

Hold down the **Windows** key and the **Shift** key then tap on the letter **S**

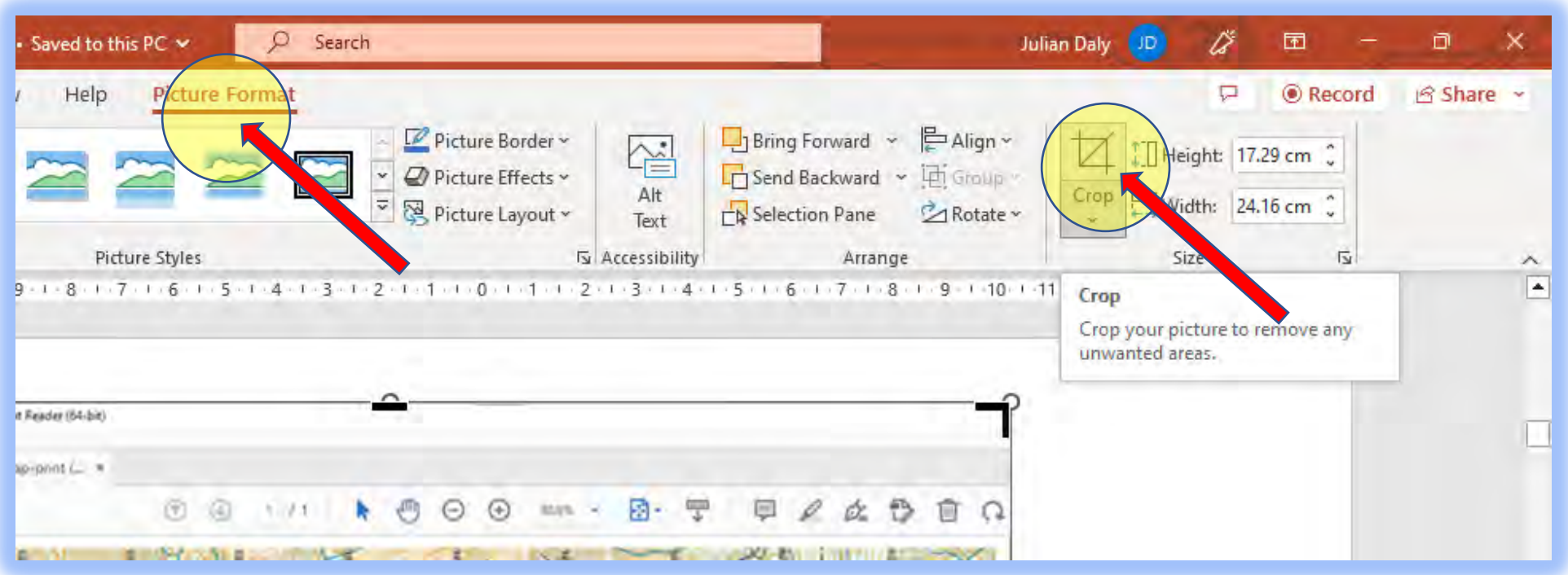
The screen turns ‘grey’.

You are now able to select the area you wish to copy by clicking and dragging.

Go to the PowerPoint slide you want the image to appear and **paste** (Ctrl + V)

Copying and pasting

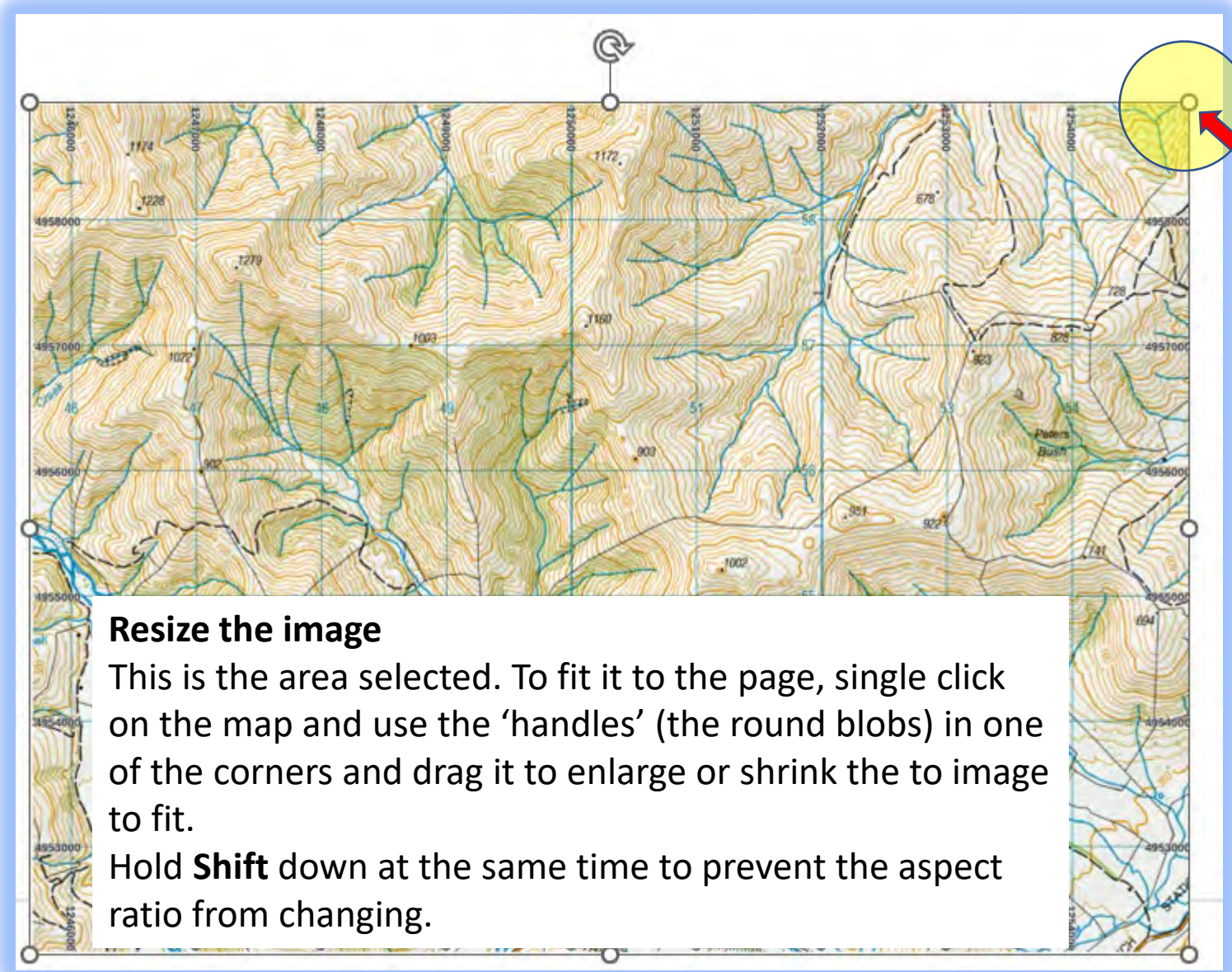
- Open the pdf making sure you are able to see the whole map.
- Hold down the **Windows** key + **Shift** key and tap on the letter **S** (for snip). This will activate the snipping tool.
- The screen now has a ‘grey tinge’ to it.
- Using your mouse, click with the left mouse button and drag to cover the area you want.
- Once you release the left mouse button, that area will be stored in the clipboard (a short term memory of things that you copy).
- Switch back to your PowerPoint presentation and the slide you wish to add the map to.
- You can either right click and choose **Paste** or use the shortcut **Crtl + V**



Cropping the image

There might be areas of the image you do not want to see.

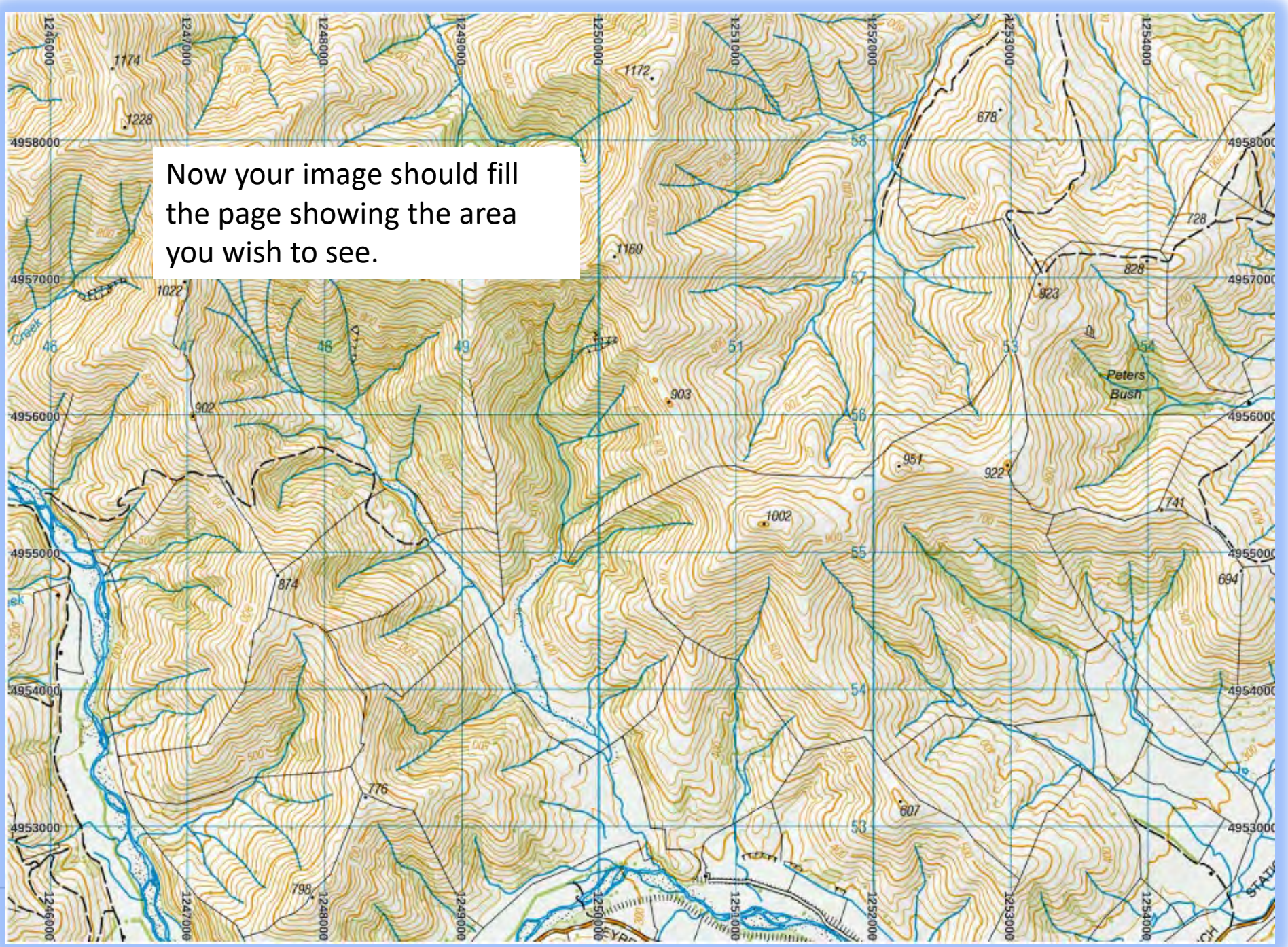
Crop the image by clicking on the image, chose **Picture Format** at the top and then **Crop** from the top ribbon.



Resize the image

This is the area selected. To fit it to the page, single click on the map and use the ‘handles’ (the round blobs) in one of the corners and drag it to enlarge or shrink the to image to fit.

Hold **Shift** down at the same time to prevent the aspect ratio from changing.


Now your image should fill the page showing the area you wish to see.
Peters Bush

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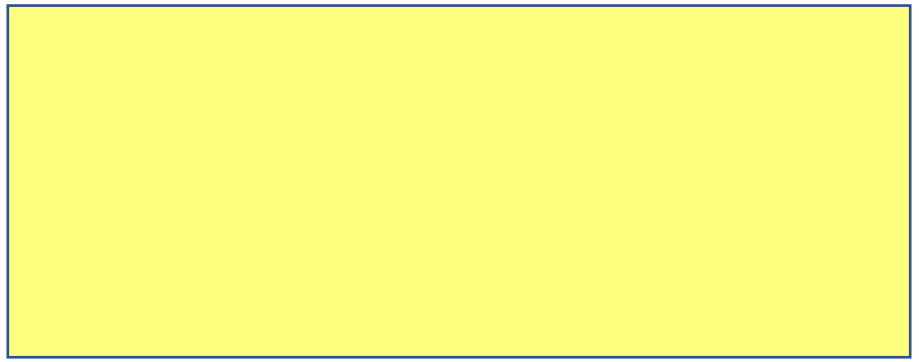
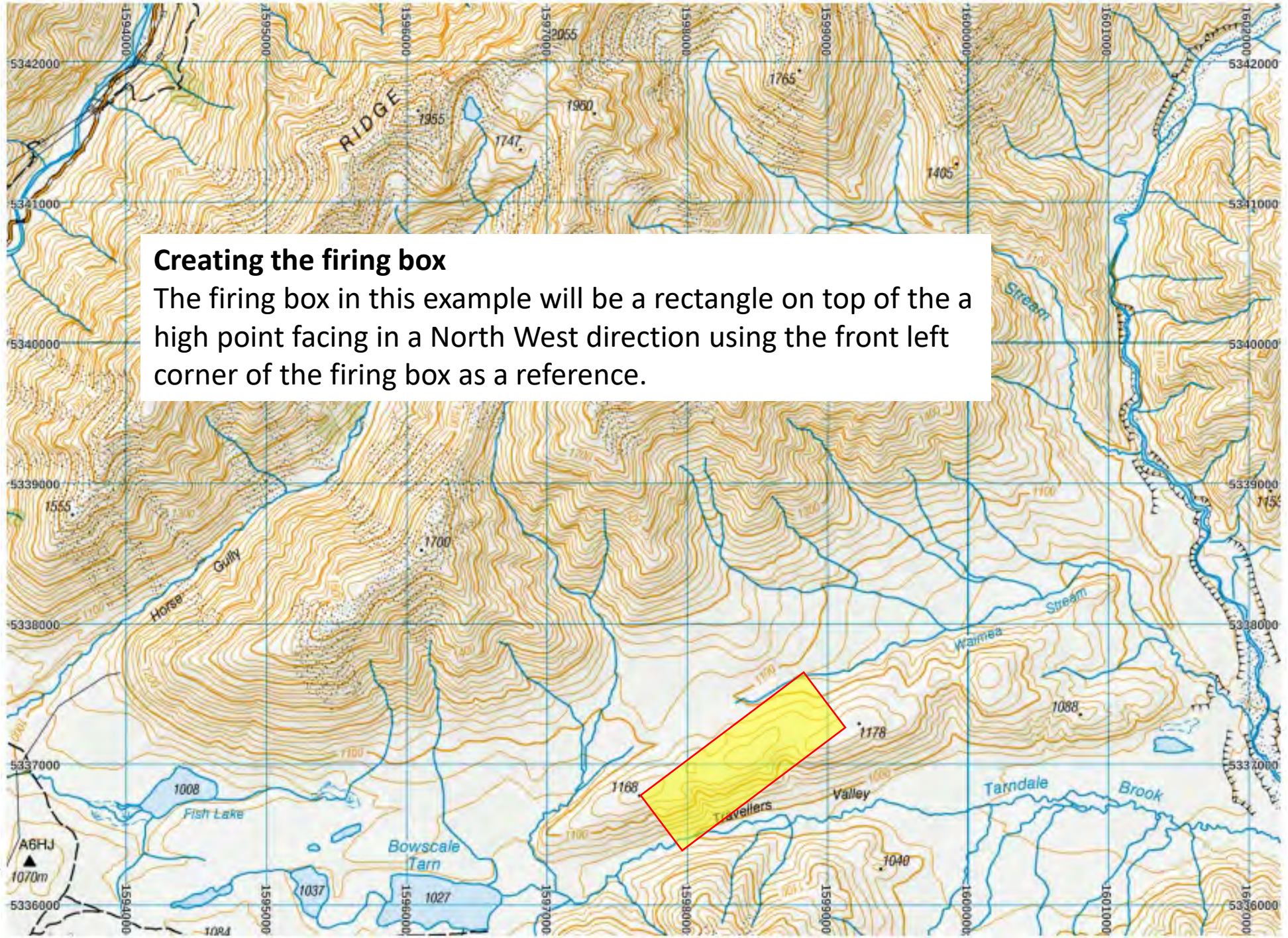
The firing box

Starting the firing box

For this example, the firing box is a rectangle, but it doesn't have to be.

Rectangles are much easier to deal with when applying a template.





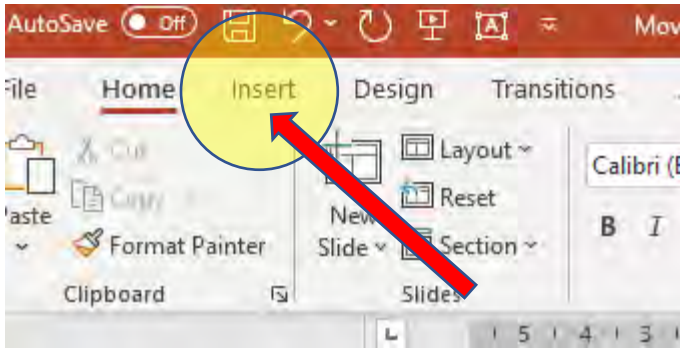
Creating the firing box

The firing box in this example will be a rectangle on top of the a high point facing in a North West direction using the front left corner of the firing box as a reference.

Creating the firing box

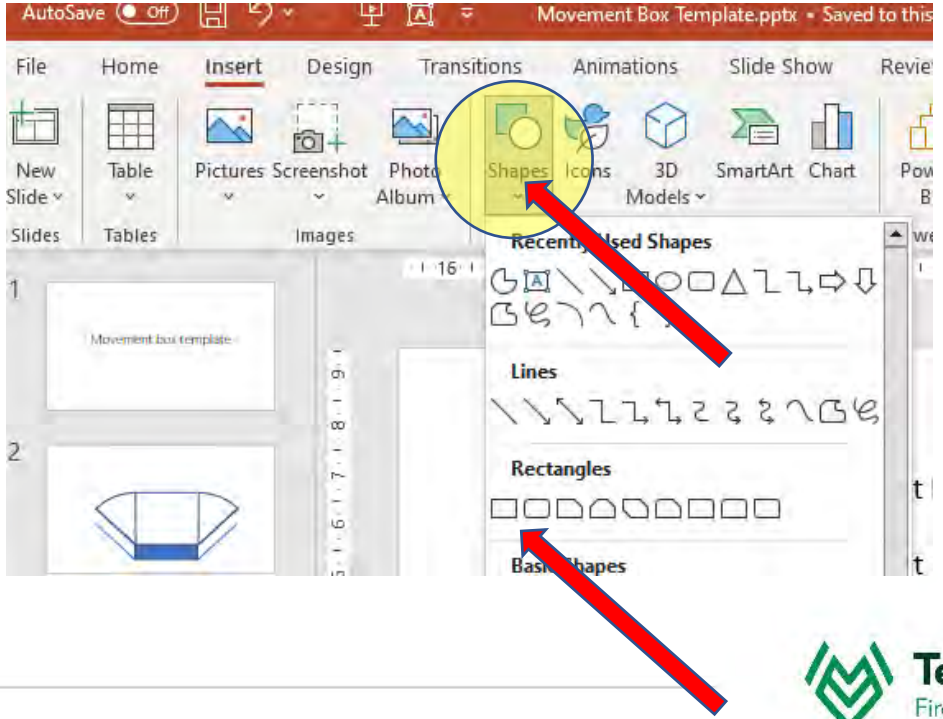
In this example, the firing box is rectangular in shape.

To insert a shape use the Insert menu located at the top left of your screen



Inserting the rectangle

Select the Shapes icon, chose the rectangle in the Rectangles selection



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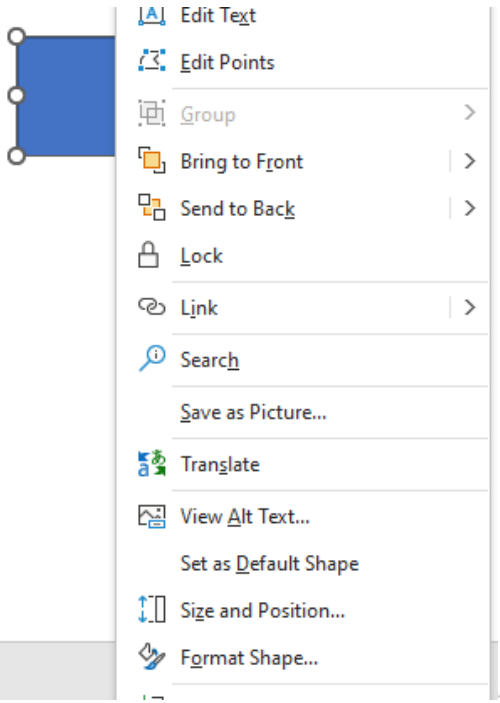
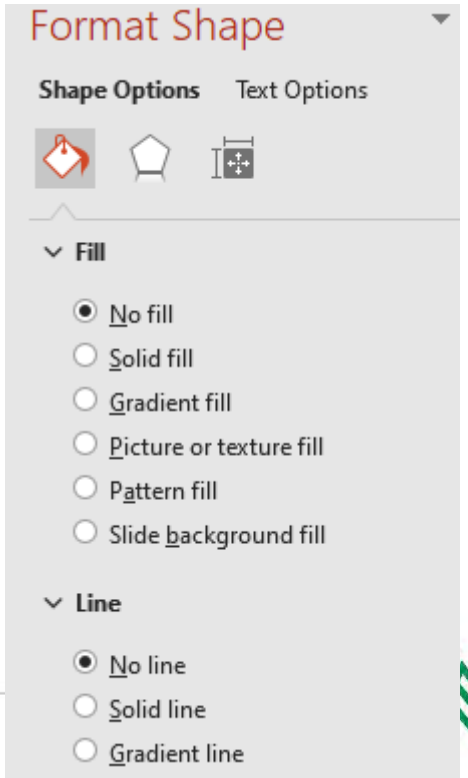
Adding colour to the firing box

This is not a necessity but makes it easier to see on the map.

Select the box by clicking on it

Right click, select **Format Shape**





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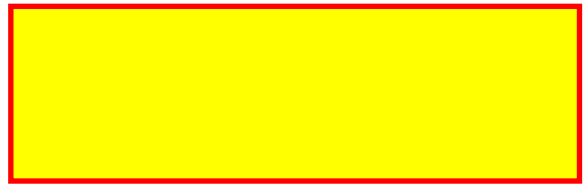
Adding colour to the firing box

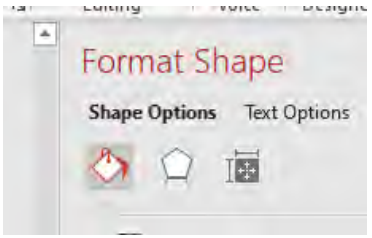
This is the original colour.

The finished colour should stand out against the map better than the original.

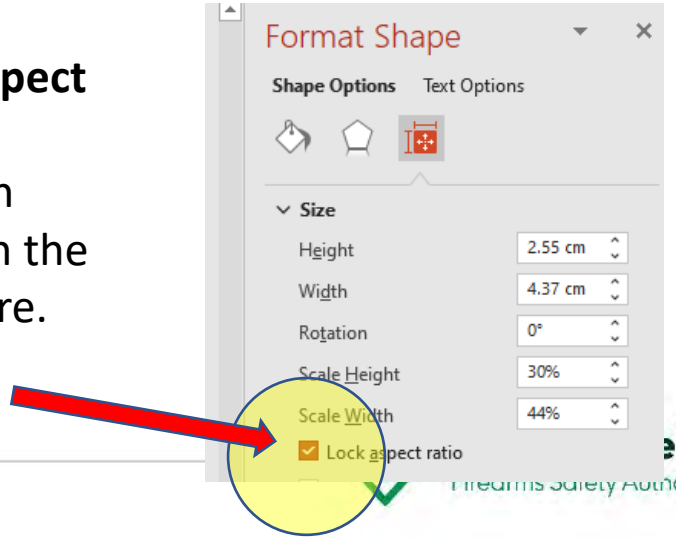


Shape Rotation

Right click on one of the lines and select **Format Shape,** it activates a menu on the right of your screen



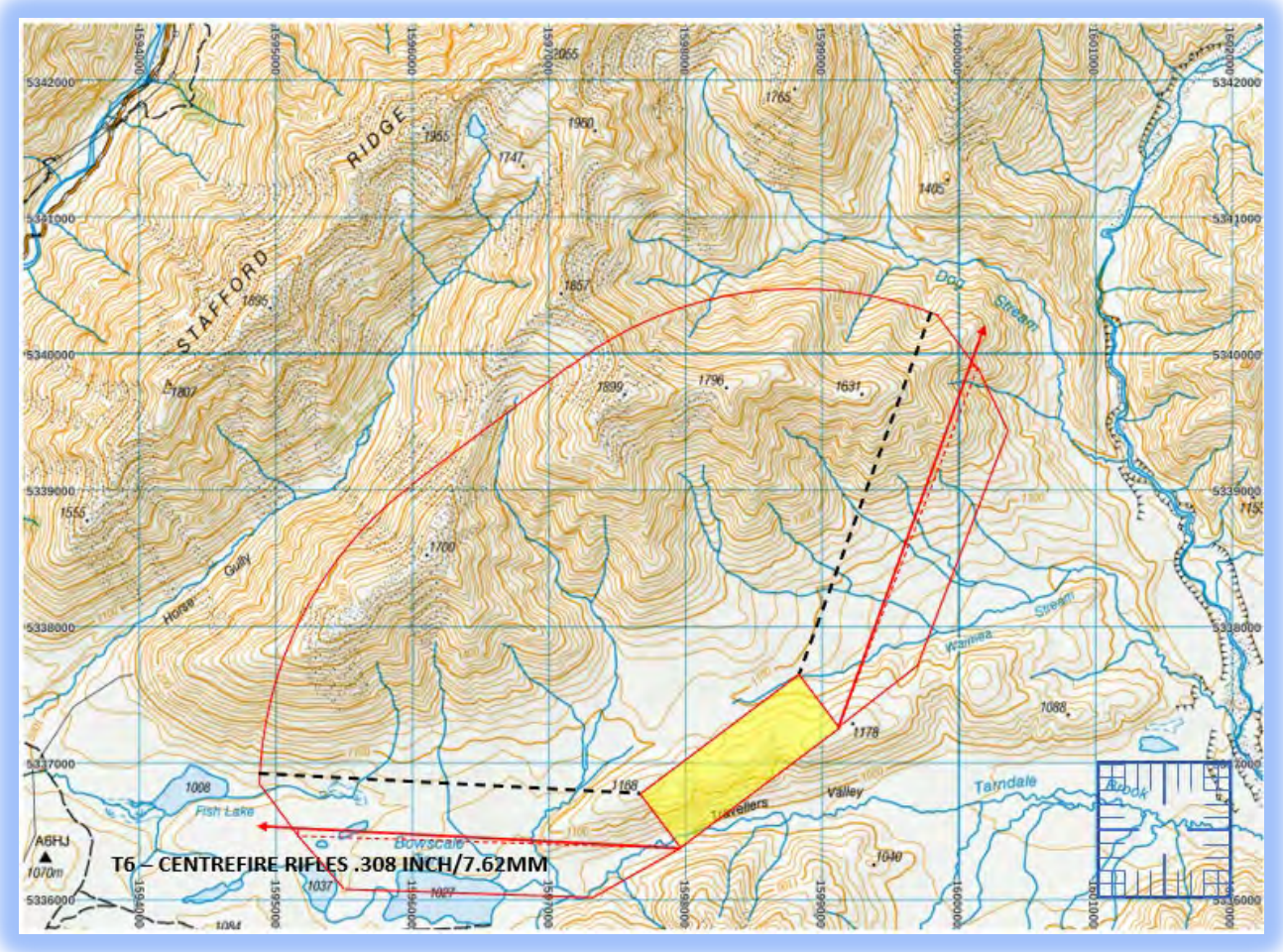
Click on the **Rotation** box. Make sure that the **Lock aspect ratio** has a tick in the box. Either use the up and down arrows in the box or type in the angle of rotation you require.



Selecting the template

Now the required area has been selected and made to fit the page we are able to apply the correct template to the map.

In this example, the width of the firing box will be 1500m and the depth 500m. The maximum caliber used will be 0.308/7.62, therefore the ground surface T6 Template has been selected.



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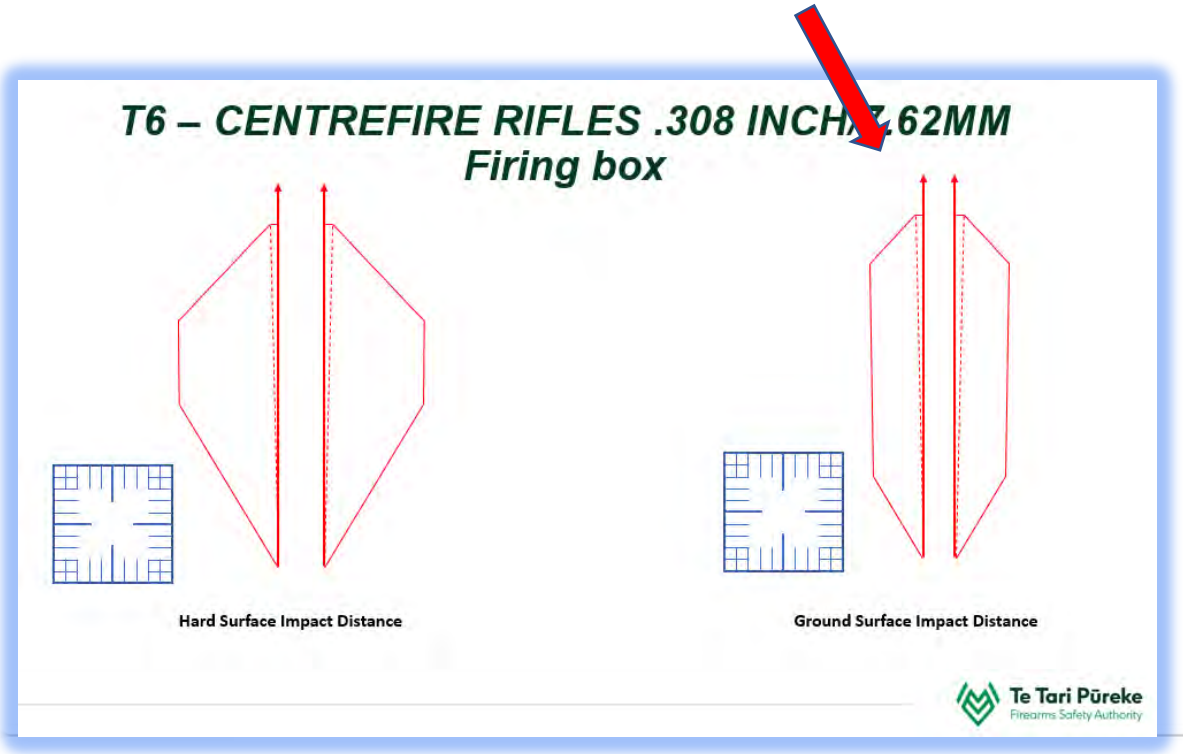
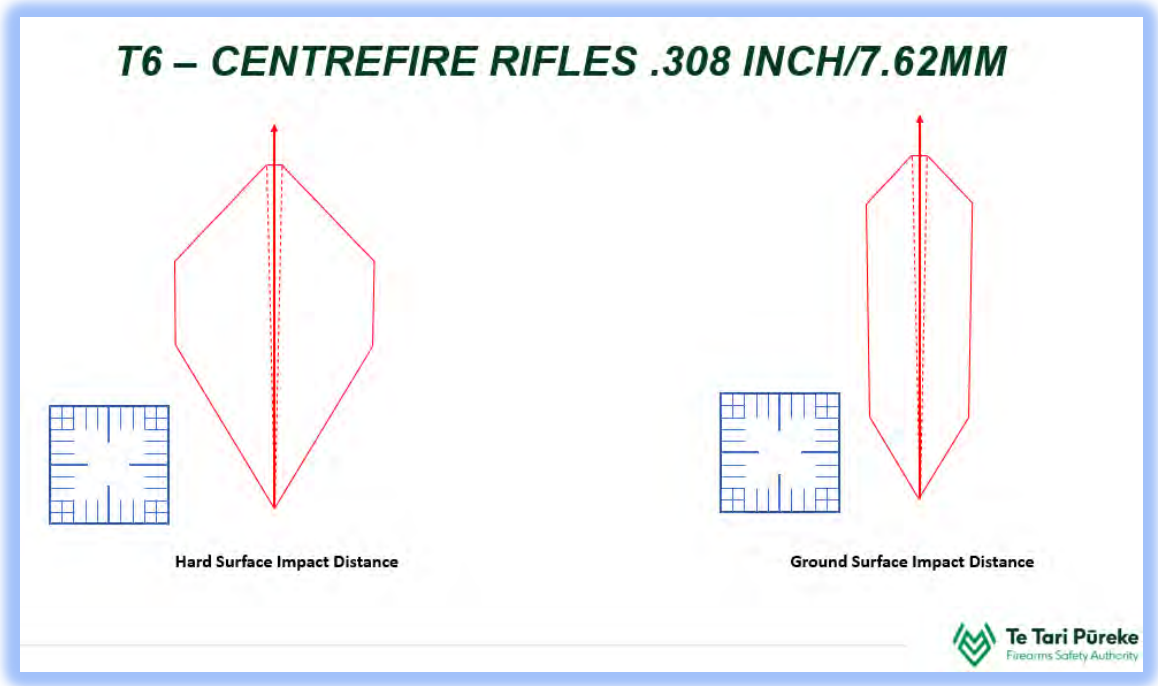
Template selection

There are two pages for the T6 Template. In this instance, the firing box is 1500m wide and 500m deep. It is not a hard surface, therefore we require left and right halves of the template Ground Surface template.

Click on one of the template lines, copy it then paste it onto your map.





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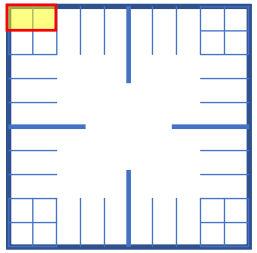
Resizing the firing box using the romer – an example

The romer is used to ensure all objects are drawn to the correct scale.

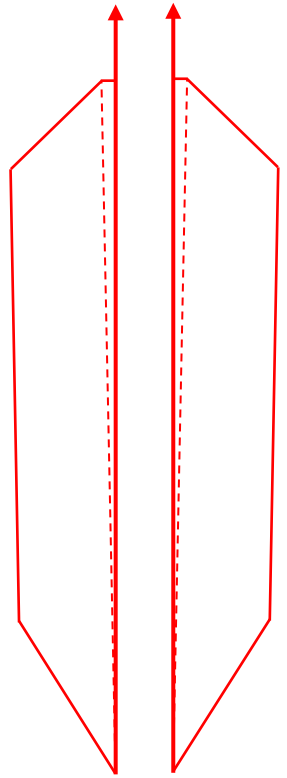
For example. A firing box could be 200 X 100 metres

To create this to the correct scale it can be drawn using the romer. A romer is 1km (1000m) square. The graduations within represent 100m.

Initial drawing of the rectangle



Drawn to scale using the romer

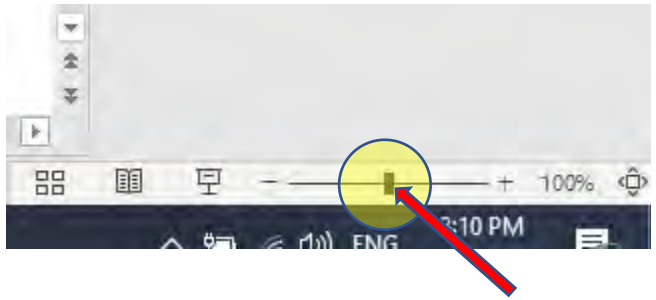


Zooming in and out

It's much easier to see things and move parts accurately when you are able to zoom in.
For this example, the map will be used to demonstrate the zoom function in PowerPoint.

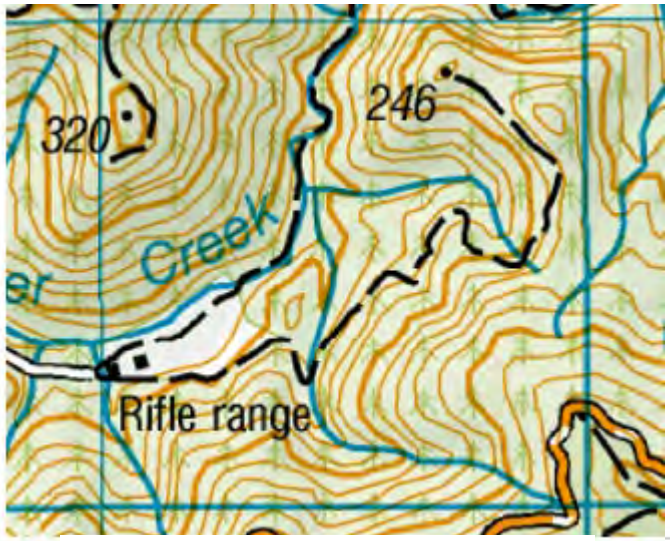
The Zoom slider

If you look on the bottom right of your screen you will find the zoom slider. Moving to the left will move your point of view closer, to the right, further away.



Tip

You can achieve the same result by holding the Ctrl button on the keyboard and using the mouse scroll button.



No zoom (normal view)

Zoomed in

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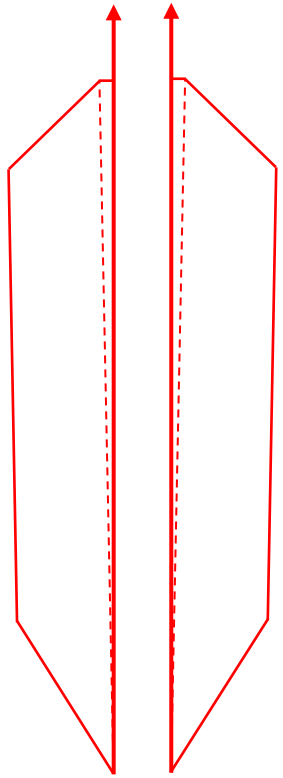
1500m X 500m firing box

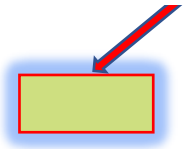
The firing box we require is bigger than the romer.

In this example, the firing box is 1500 X 500 metres

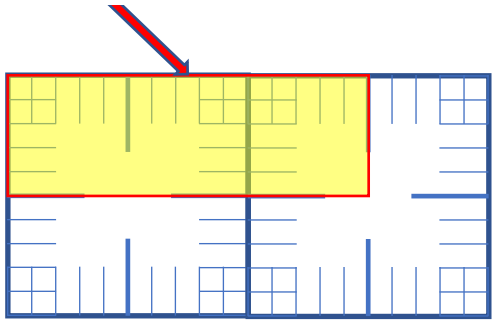


Select the romer, **Ctrl + C** to copy, **Ctrl + V** to paste.
Use the mouse to drag it into place, zoom in, using the arrow keys to make sure the second romer is placed accurately. Once you have both romers in place, drag the firing box over the two romers and resize.

Before



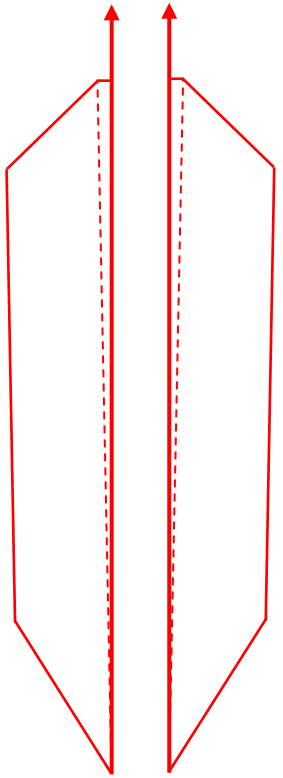
After

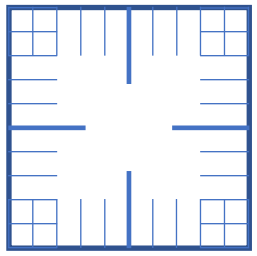


Constructing the firing box

As two romers weren't required, one of them was deleted. The other moved away from the 'working area' of the screen. This leaves the firing box and template both to the same scale.

The next step is to rotate the firing box to the required angle.





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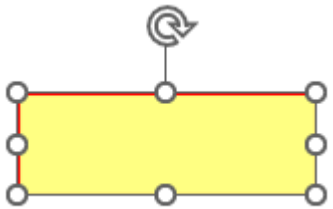
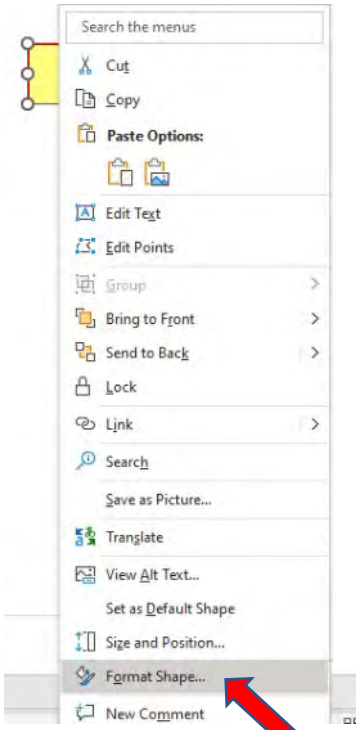
Rotating objects

Rotating an object

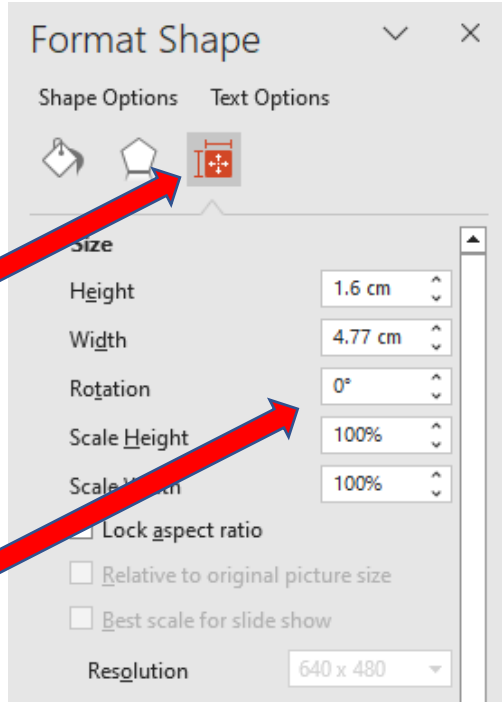
Objects can be rotated accurately in PowerPoint using the Format menu.



Select the object(s) to be rotated by clicking on one of the lines.



Select **Format Shape**



Size & Properties

Type the angle required in the **Rotation** field

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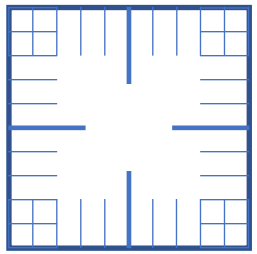
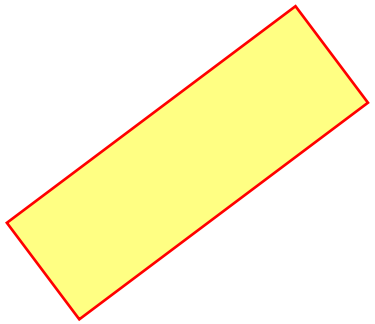
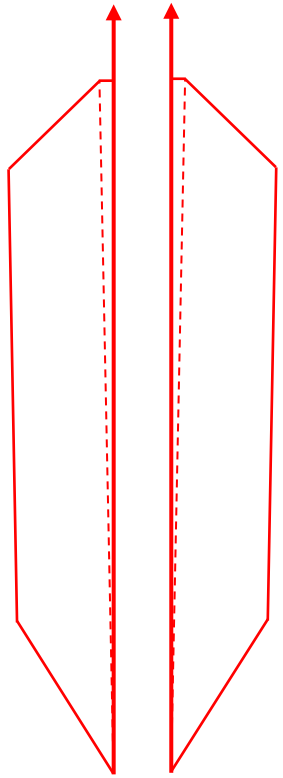
Bearing of the firing box

It is very unlikely that your firing box will be oriented directly North.

The firing box in this example will need to be rotated to the correct bearing. In this case it is rotated to **323^0 grid**.



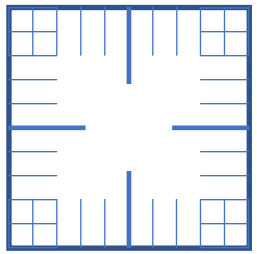


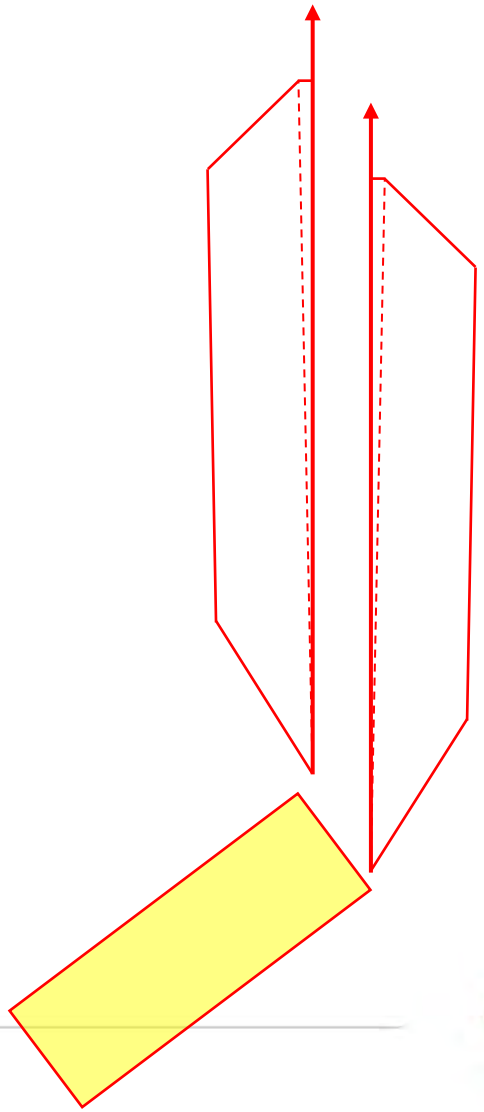


Right template roughly into position

Position the firing box below the template. In this example the bottom right corner of the box was aligned with the bottom of the centre line of the right template.

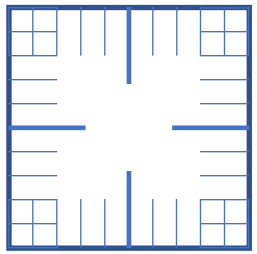
As before, zooming and using the keyboard arrow keys makes this a lot easier.

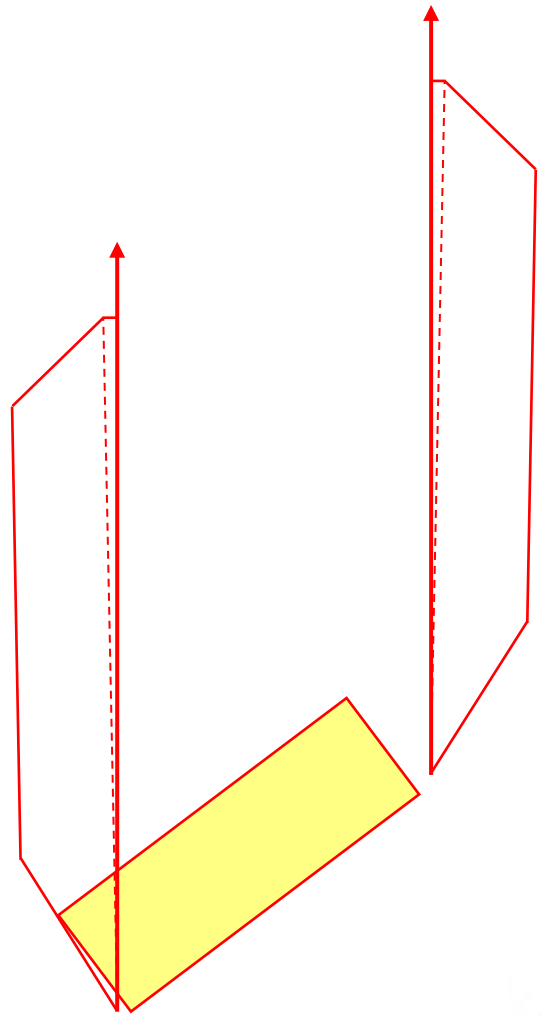




Left template roughly into position

If the left and right templates are grouped, ungroup them so they are able to be moved separately.



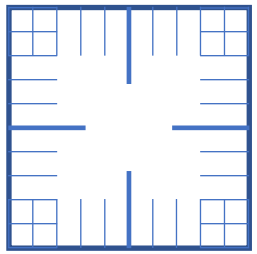


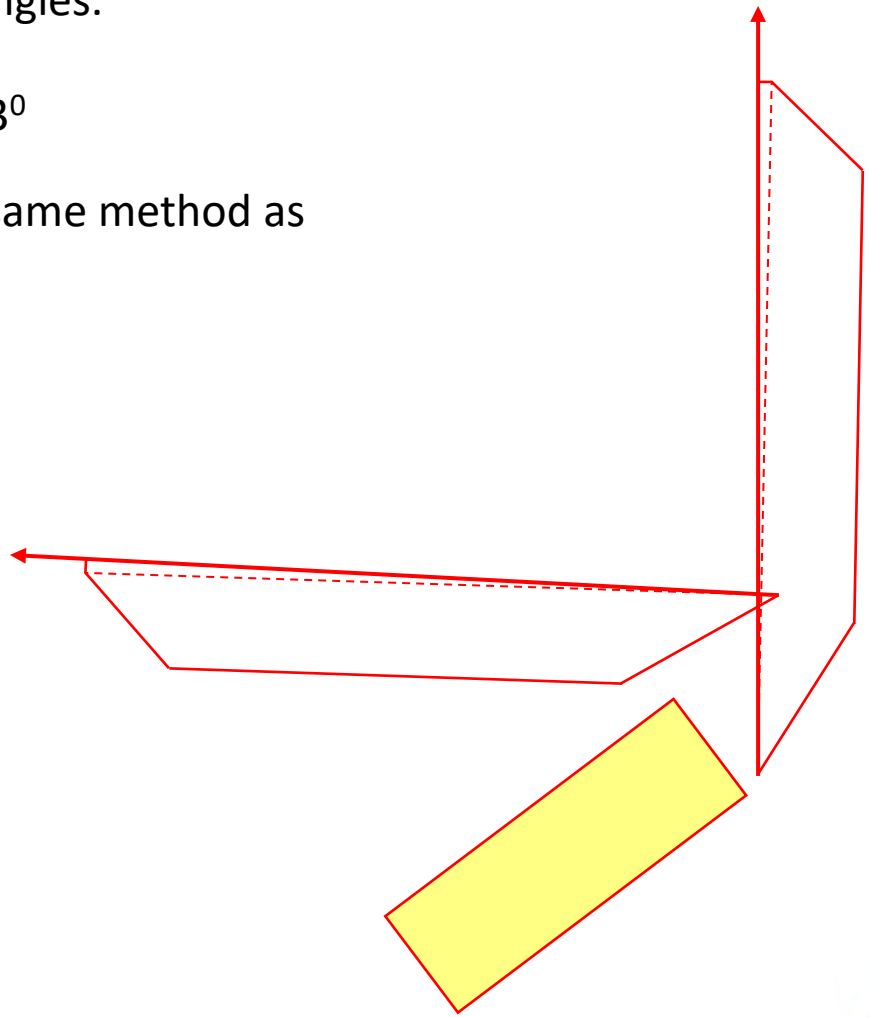
Aligning the left template

The left and right templates are at separate angles.

In this example the left is rotated until it = 273^0

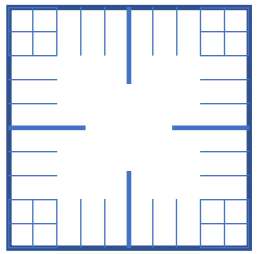
Select the left template and rotate using the same method as used on the firing box.

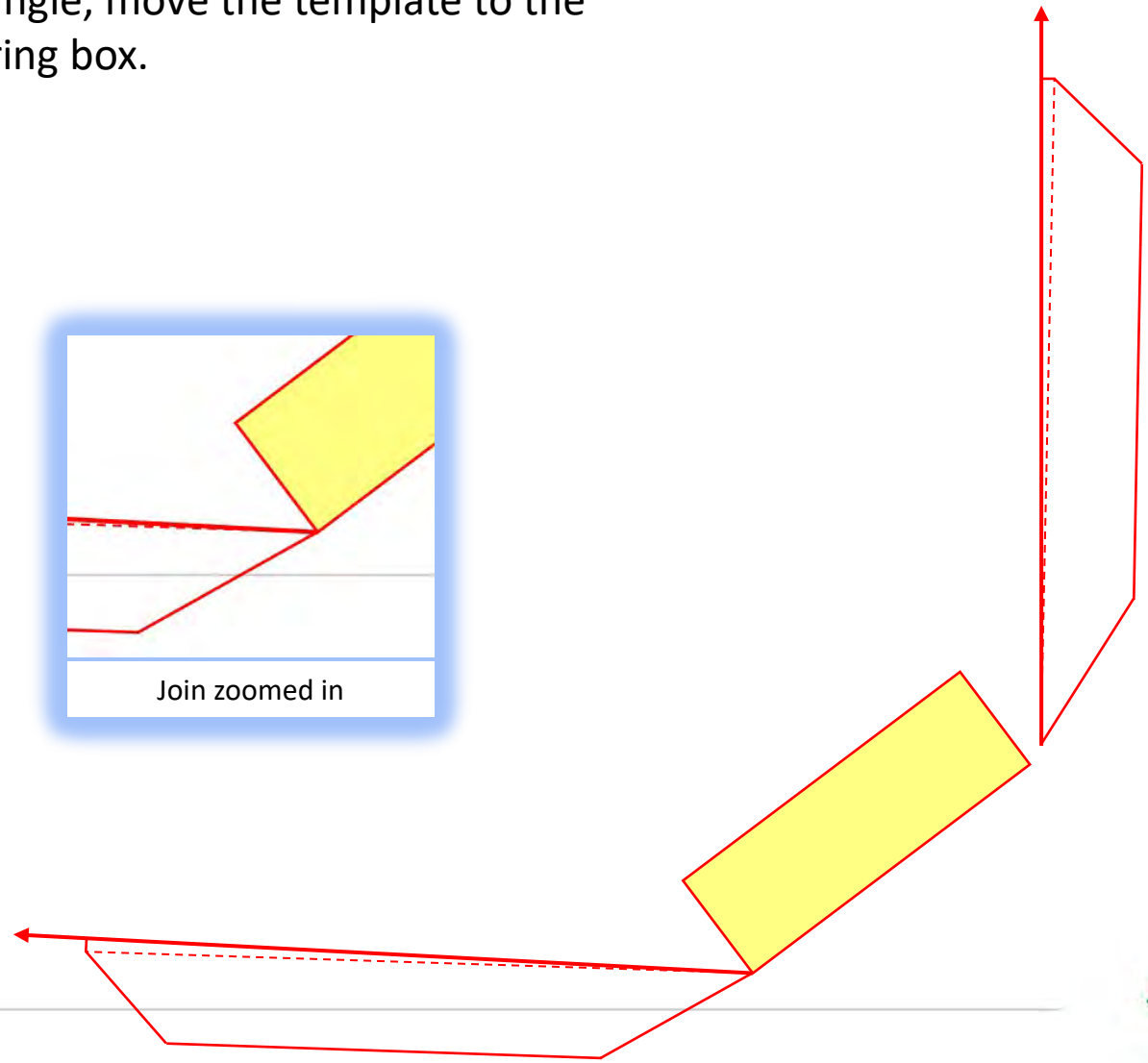




Aligning the left template

Once rotated to the correct angle, move the template to the bottom right corner of the firing box.

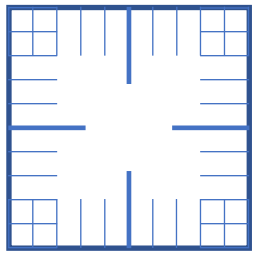


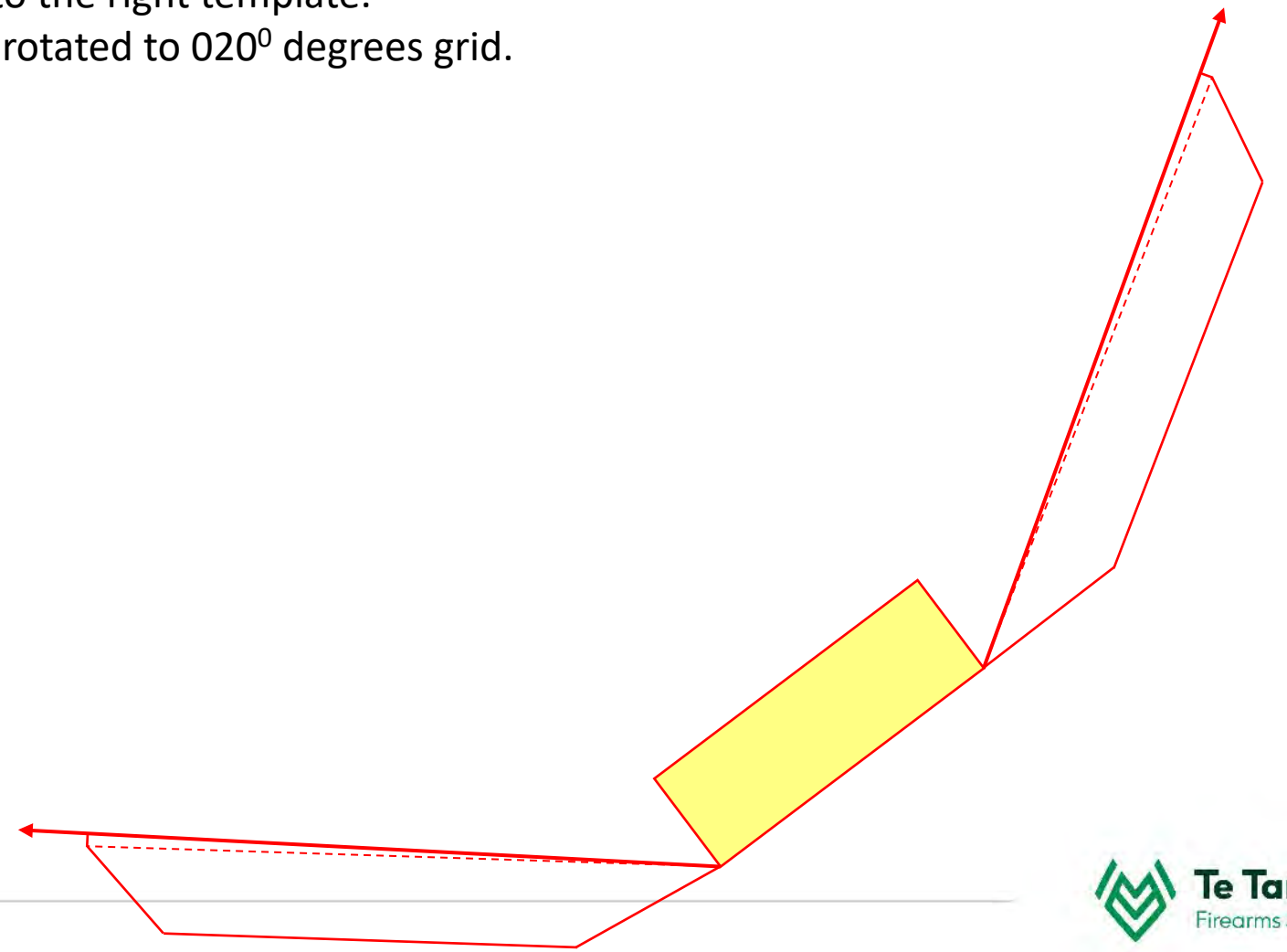


Aligning the right template

Now the left template has been rotated at the correct angle, the same process is applied to the right template.

The right template has been rotated to 020^0 degrees grid.





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Firearms Safety Authority

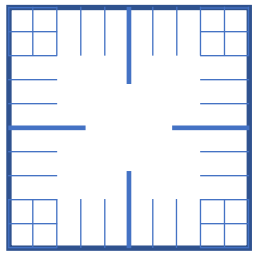
Construction lines

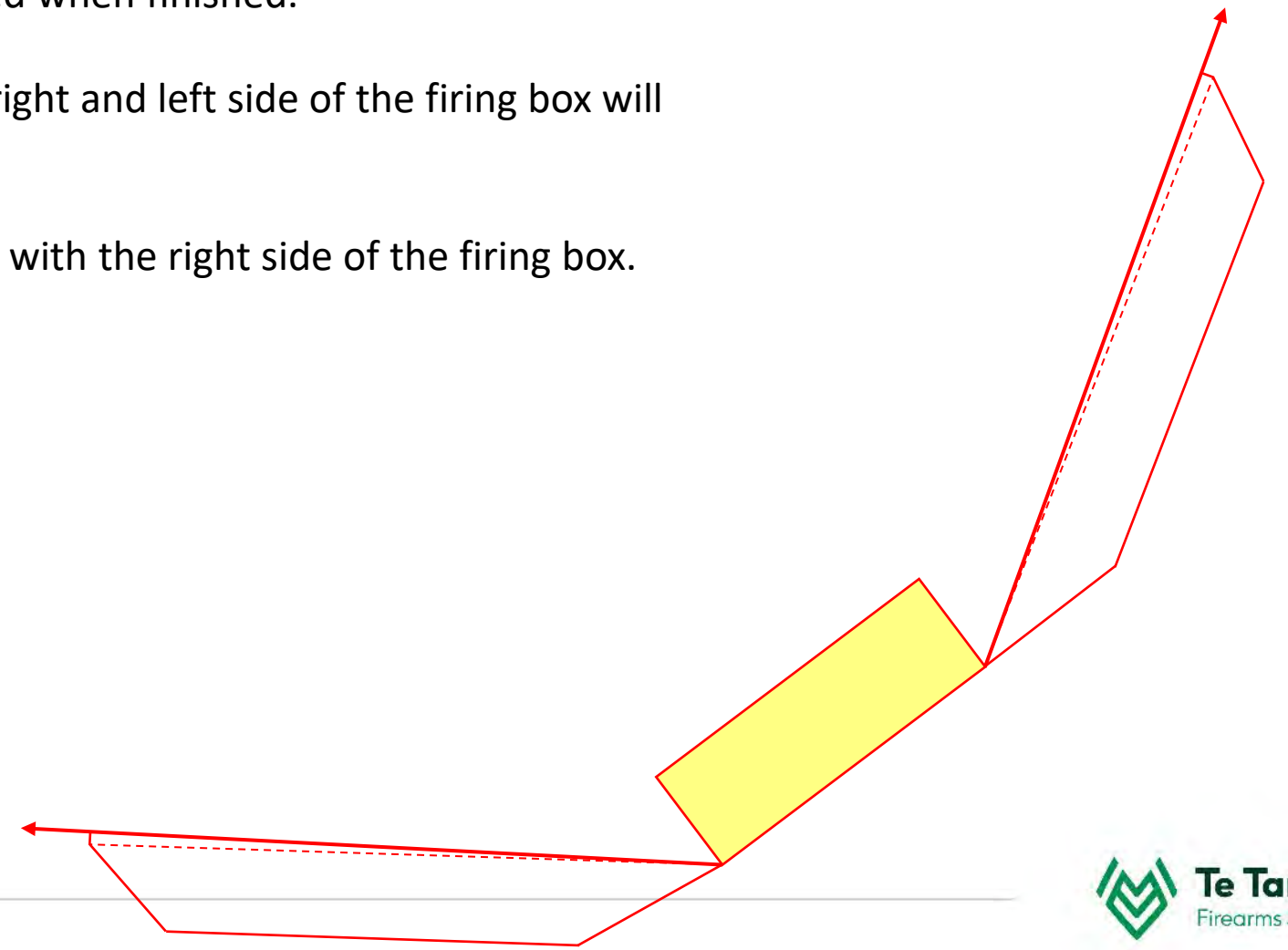
Construction lines

To find the radius of the arcs required some construction lines are needed. These will be deleted when finished.

Parallel bearing lines to the right and left side of the firing box will assist us.

In this example, we will start with the right side of the firing box.



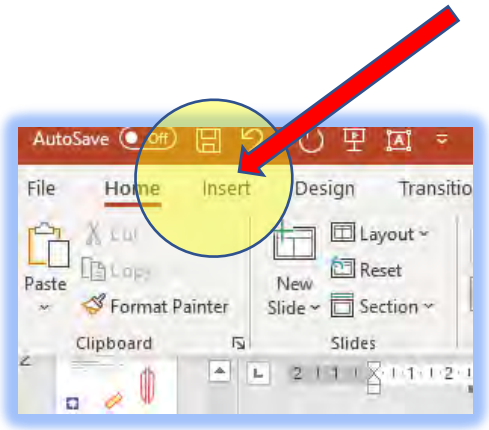


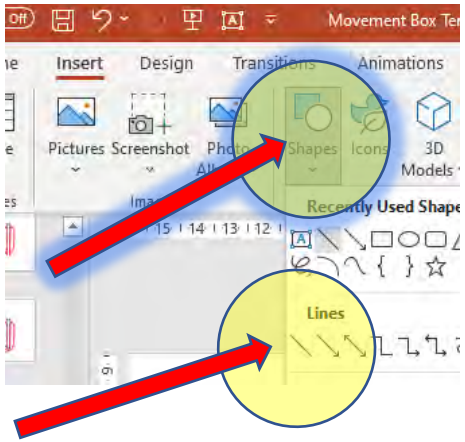
Inserting a vertical line

To make it easier, zoom into the right end of the firing box.

At the top of the screen click **Insert,** select **Shapes** then **line.**

Click and drag to create a line roughly parallel





After selecting the line tool, hold down Shift and drag vertically. This forces a vertical line.

Parallel bearing lines

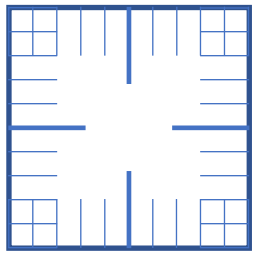
Create a vertical line (hold **Shift** whilst dragging)

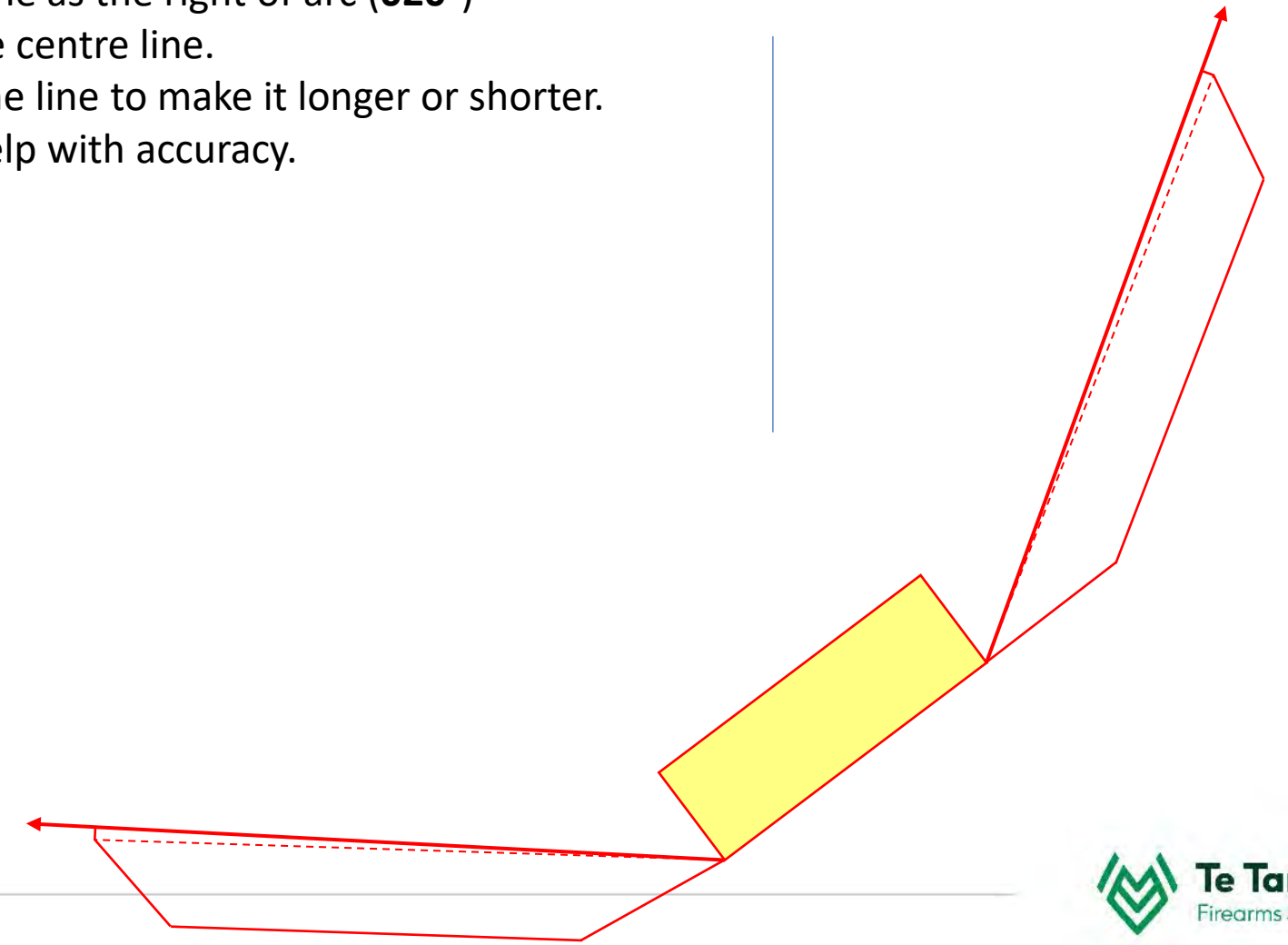
Rotate the line to be the same as the right of arc (**020^0**)

Place it near to the template centre line.

Hold **Shift** whilst dragging the line to make it longer or shorter.

Use the zoom function to help with accuracy.

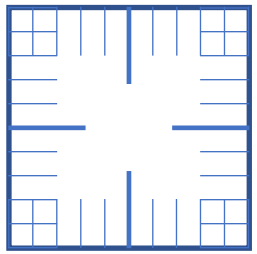


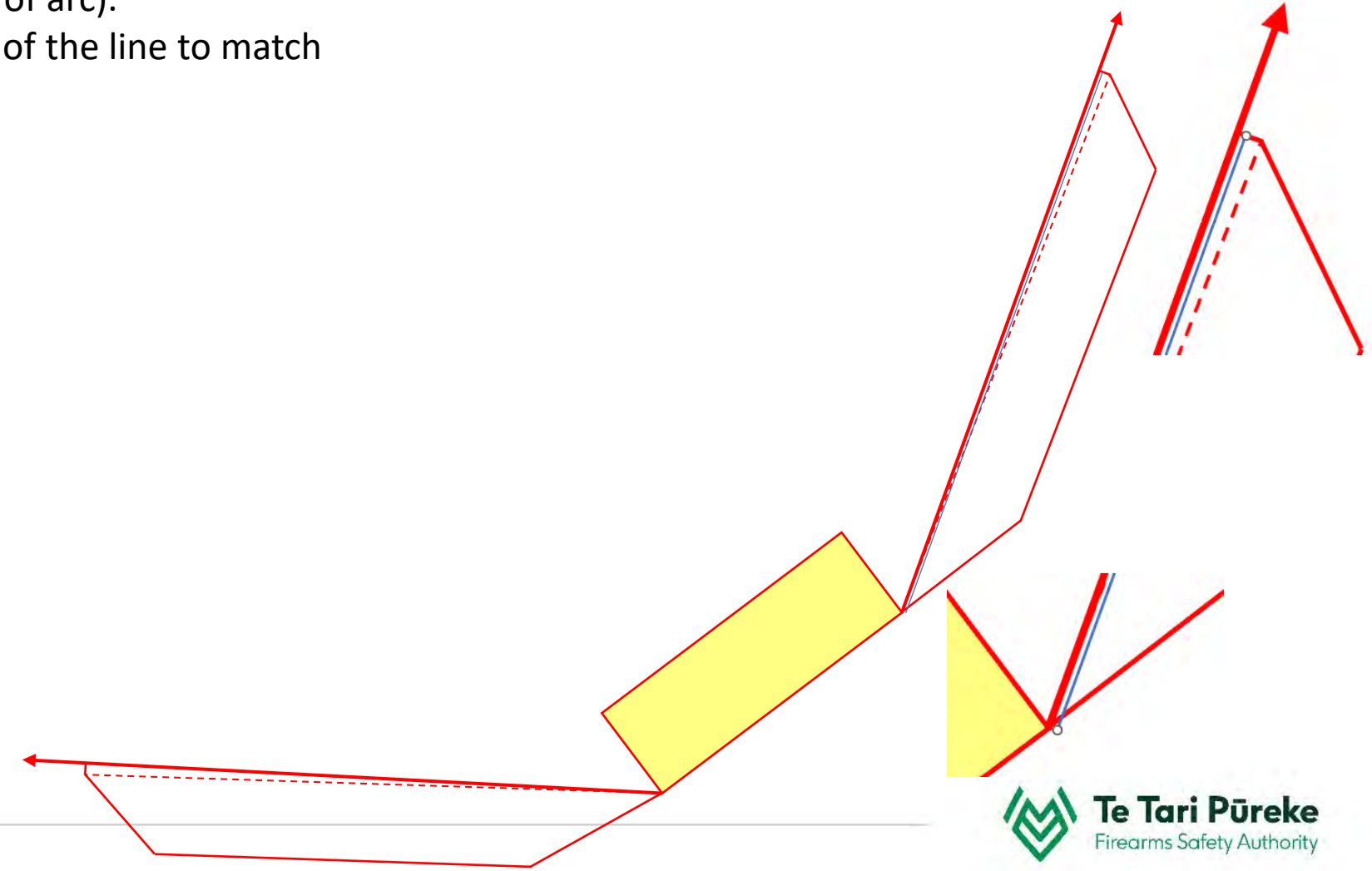


Parallel bearing line length

Here the new blue line is very close to the centreline of the ROA (Right of arc).

Holding **Shift**, drag the ends of the line to match the length of the template.

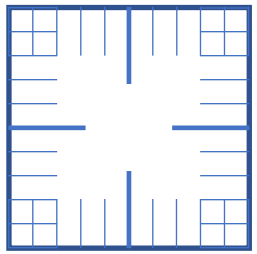


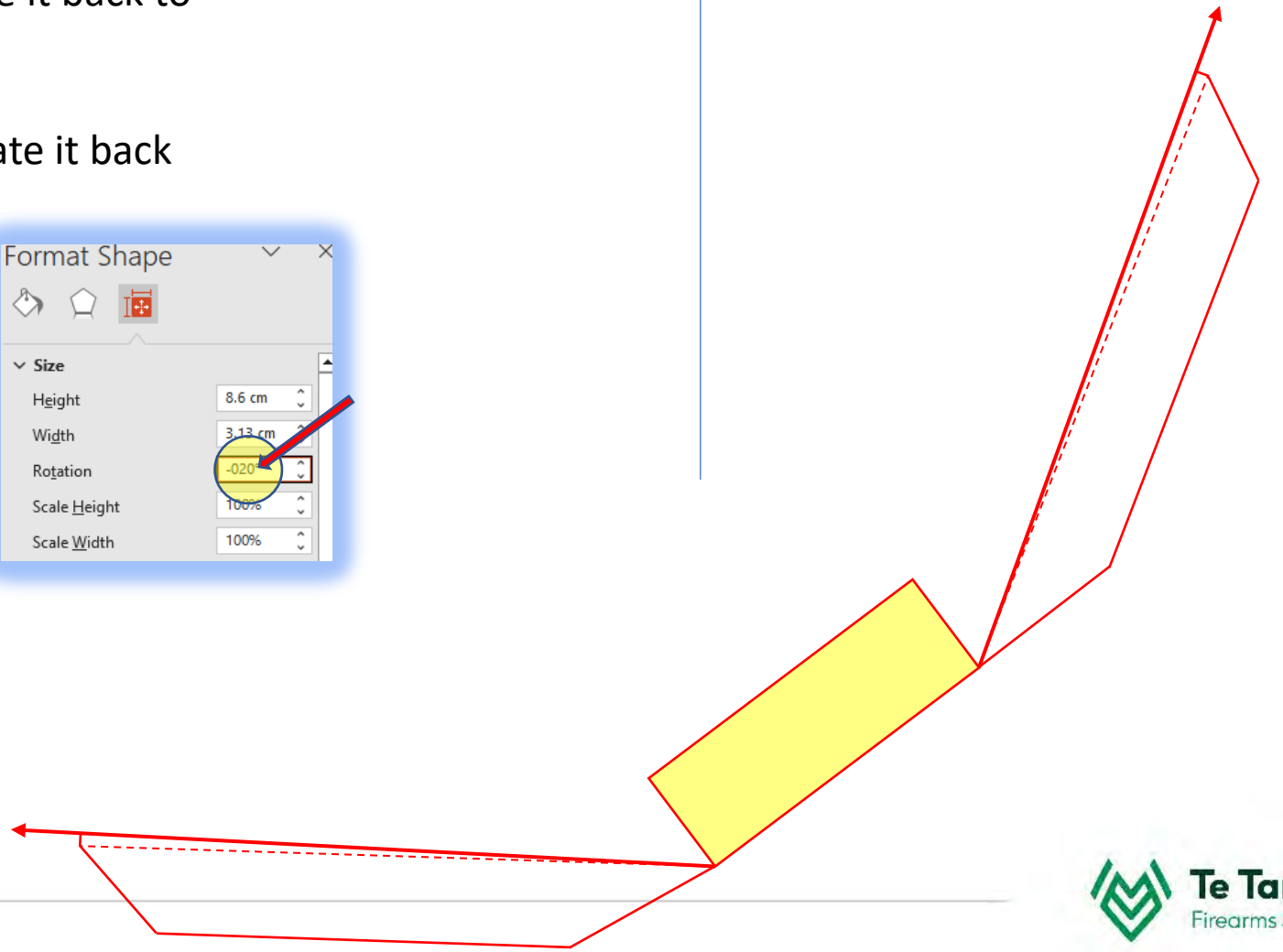


Parallel bearing lines

Move the new blue line to a convenient place on your page and rotate it back to the vertical again as before.

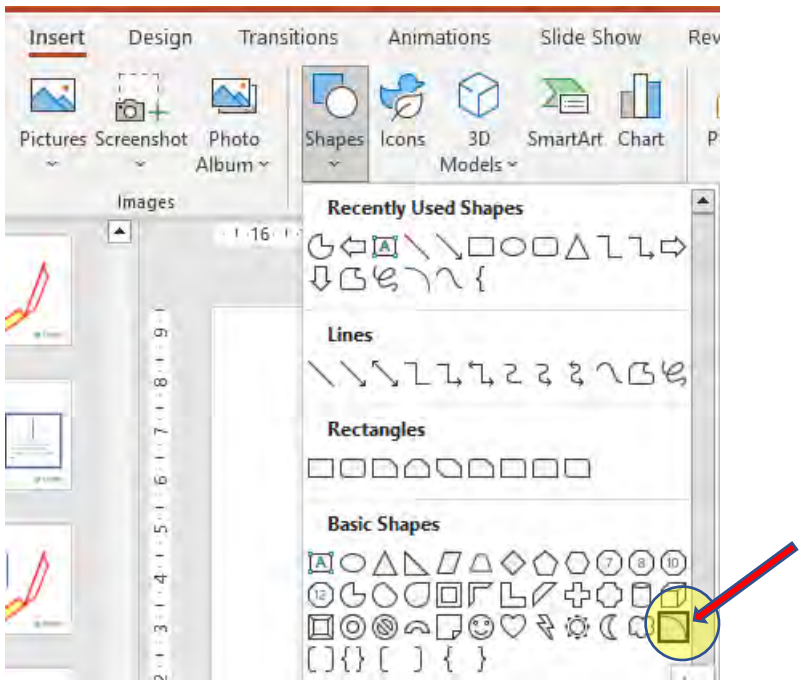
It was rotated to **020^0**, to rotate it back again **-020^0** can be used





Arc construction

Now the radius of the arc has been determined the arc needs to be used.

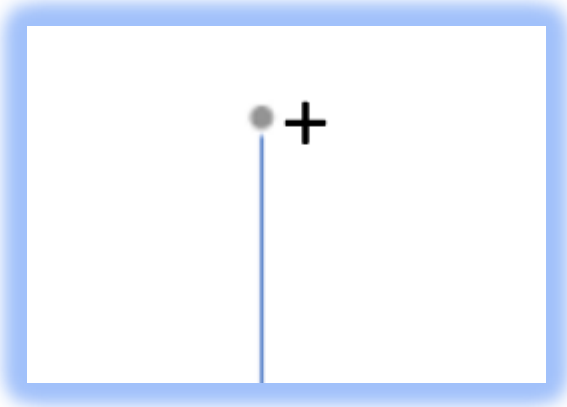


Arc construction

Once an object has been rotated, PowerPoint still thinks that it is contained within a rectangle, therefore we have to workaround it.

Select the line tool, hold **Shift** down but place your cursor really close to the start of the original line. The top of the line will change to a grey circle. This indicates that **Snap to Object** is operating.

The line must be close otherwise the line will be created wherever you click and release your cursor.



Grey ends to the original line

Top and bottom of the lines are equal

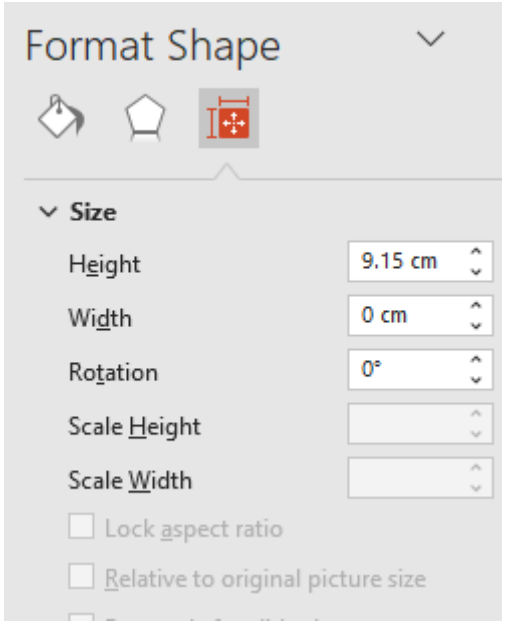
Arc construction

Using the height)found in **Format Shape**, **Height**) it is possible to create an accurate arc.

The length of the line is the radius of the arc. The diameter is required for the correct size.

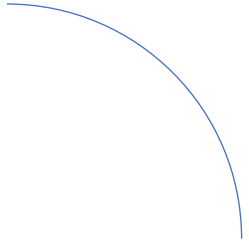
2 X Rad = Dia

In this case the radius was 9.15 so the diameter will be 18.3

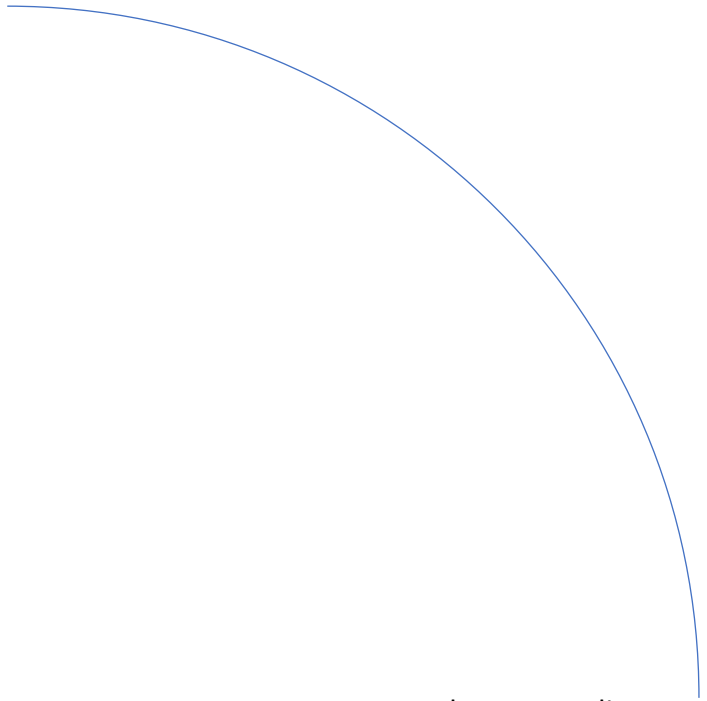


Arc construction

Select the arc tool, hold Shift and draw an arc.
Right click on the arc, use Format Shape, Size & Properties. Make sure you check the Lock aspect ratio box.
Type in the required Dia and press enter



From this size

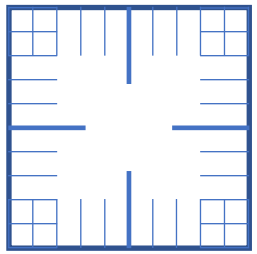


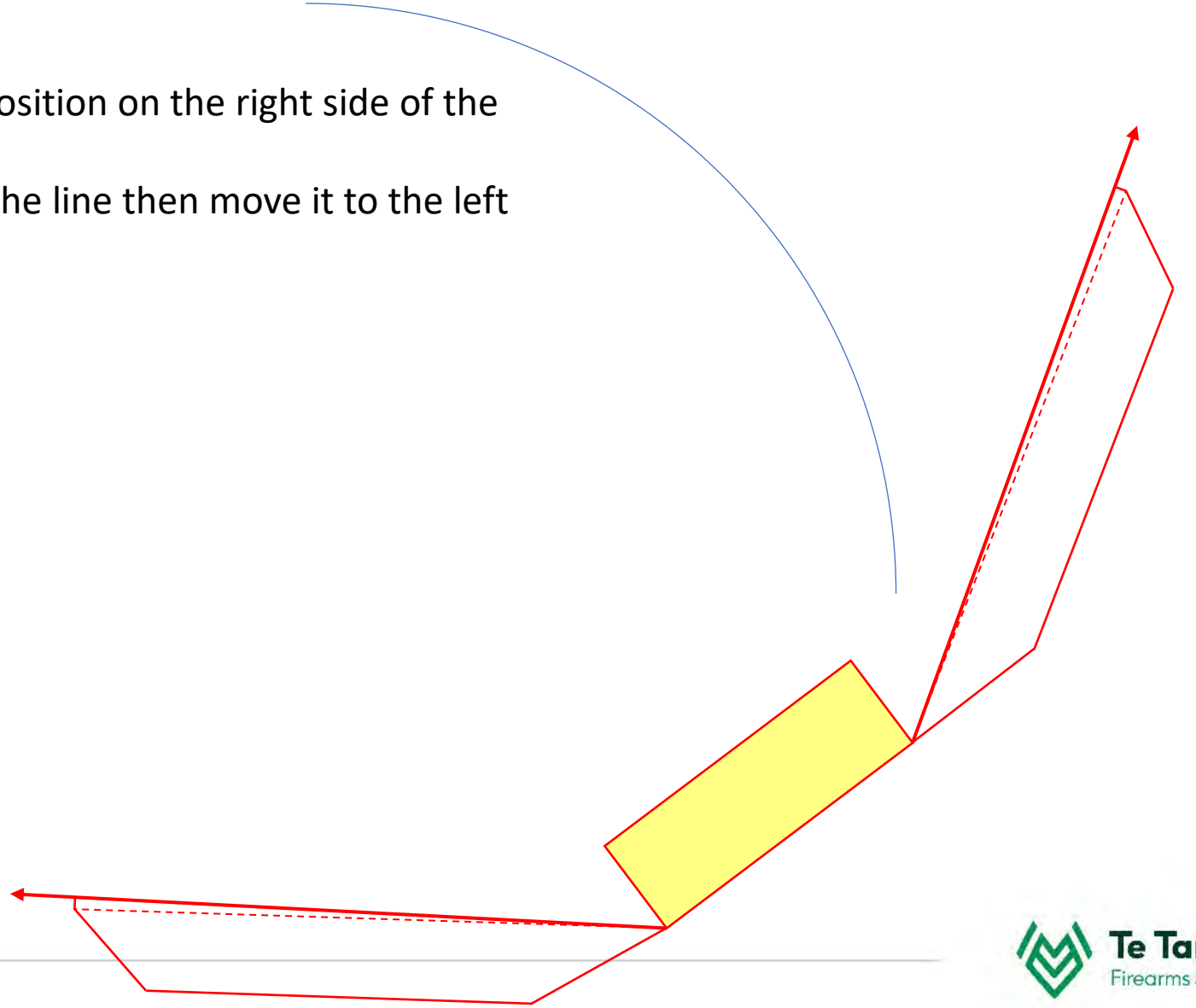
To the correct diameter of 18.3 cm

Using the arc

Click and drag the line into position on the right side of the template.

Once there, copy and paste the line then move it to the left side of the template

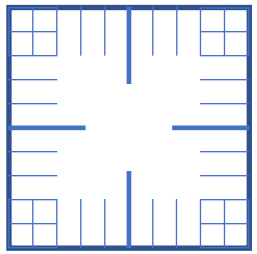


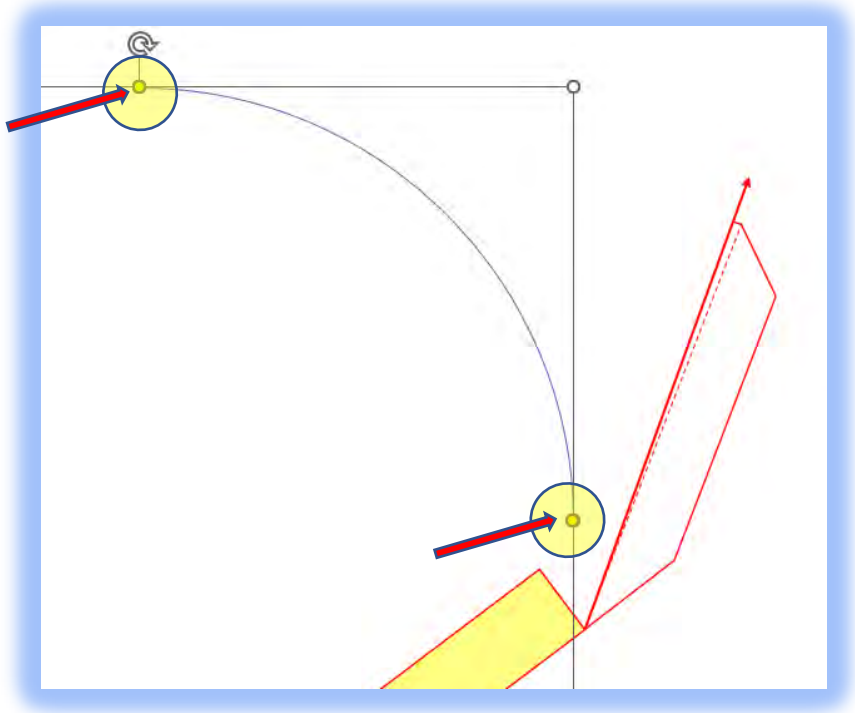


Manipulating the arc

Once the arc is the correct radius the yellow handles can be used to extend/move either end.

Once done, move the arc out of the way.

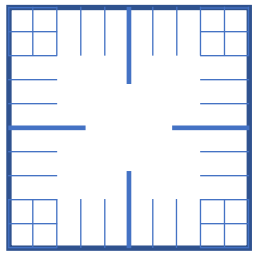


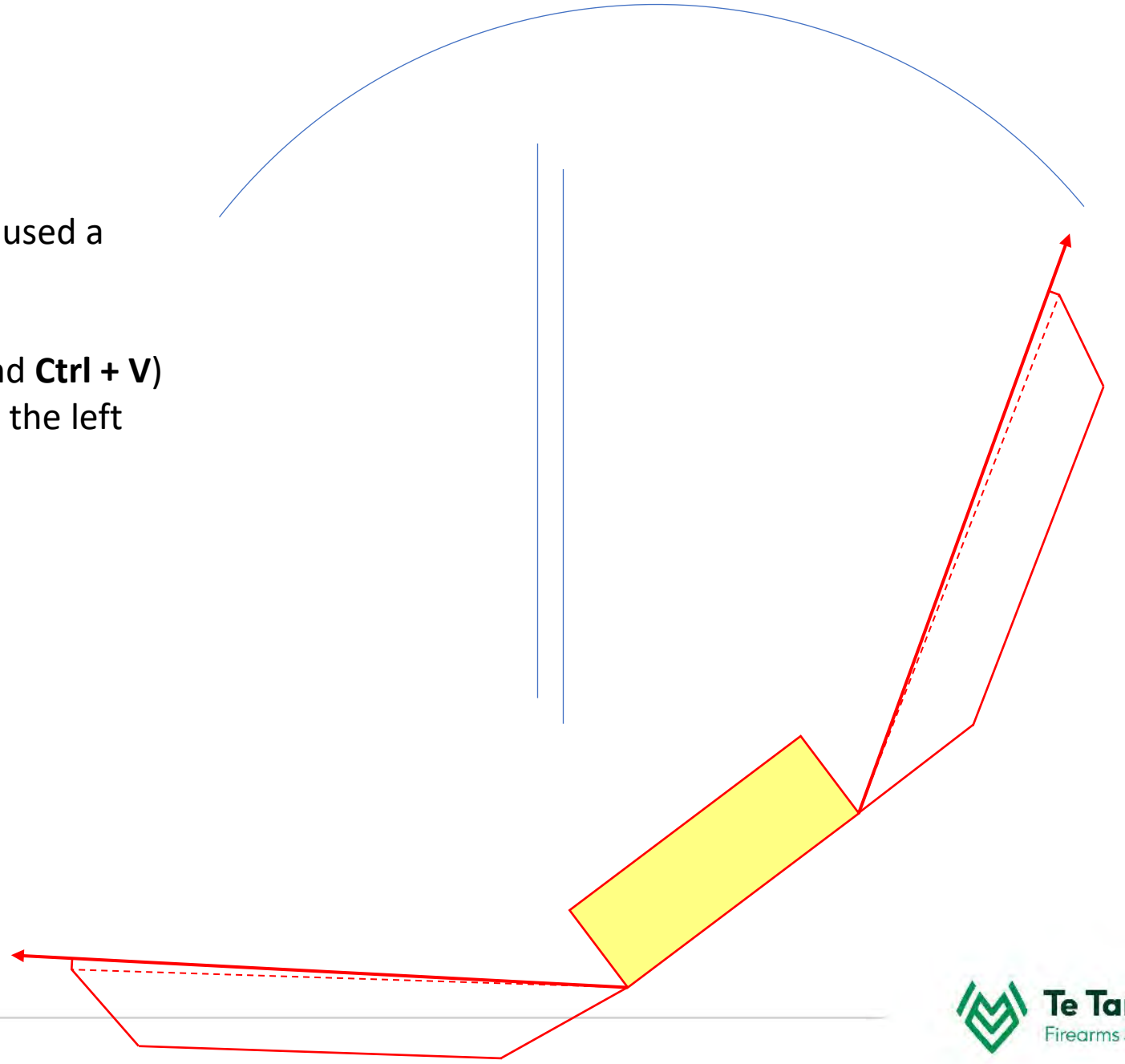


Manipulating the arc
Construction line use.

The line created previously can be used a number of times.

Copy then paste the line (**Ctrl+C** and **Ctrl + V**)
Create an extra line and store it on the left side of your page to be used later.

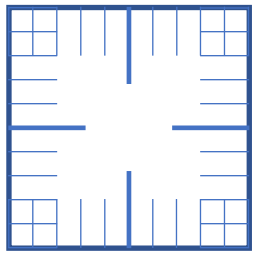


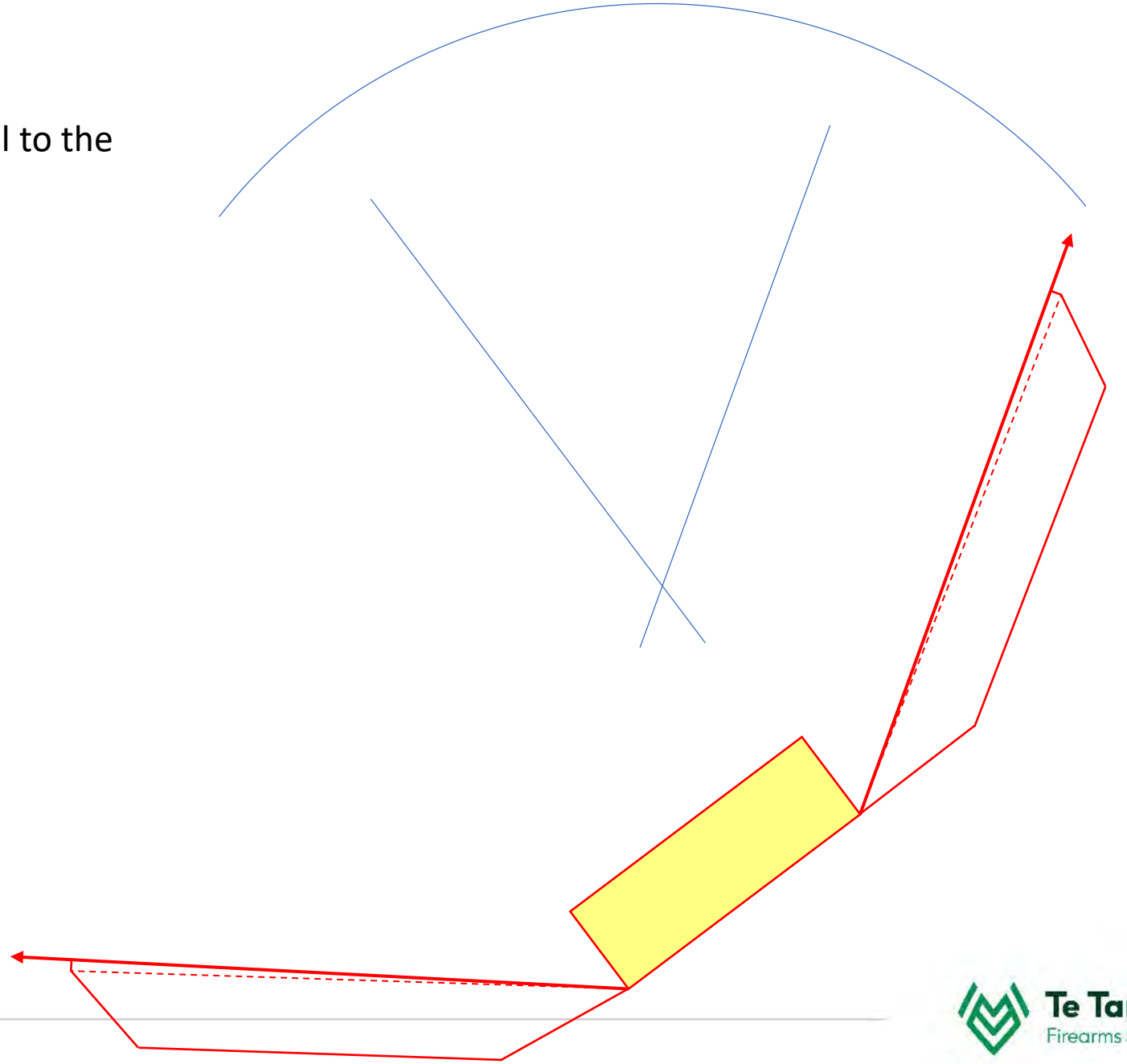


Manipulating the arc

Rotate the lines so they are parallel to the firing box.

In this case 020^0 and 323^0

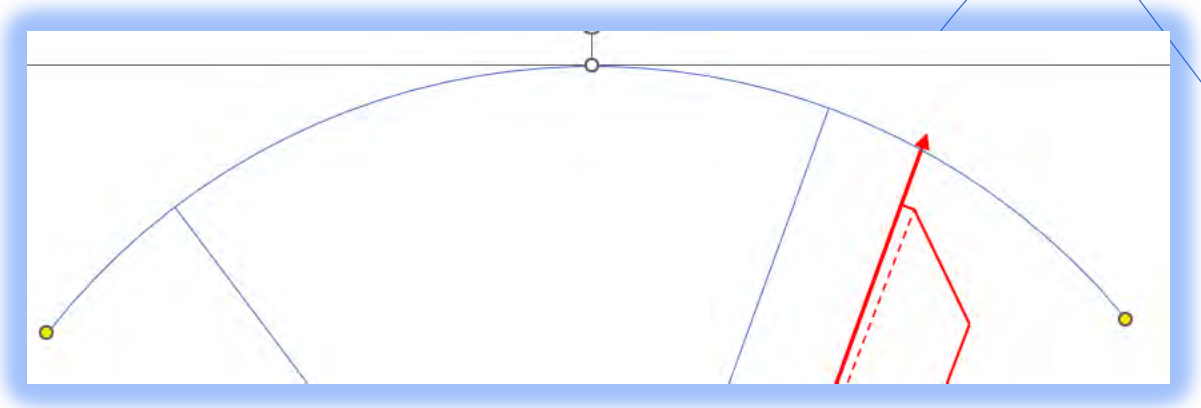


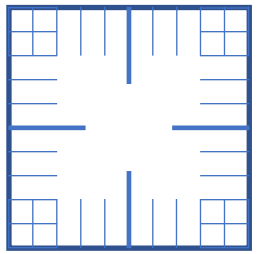


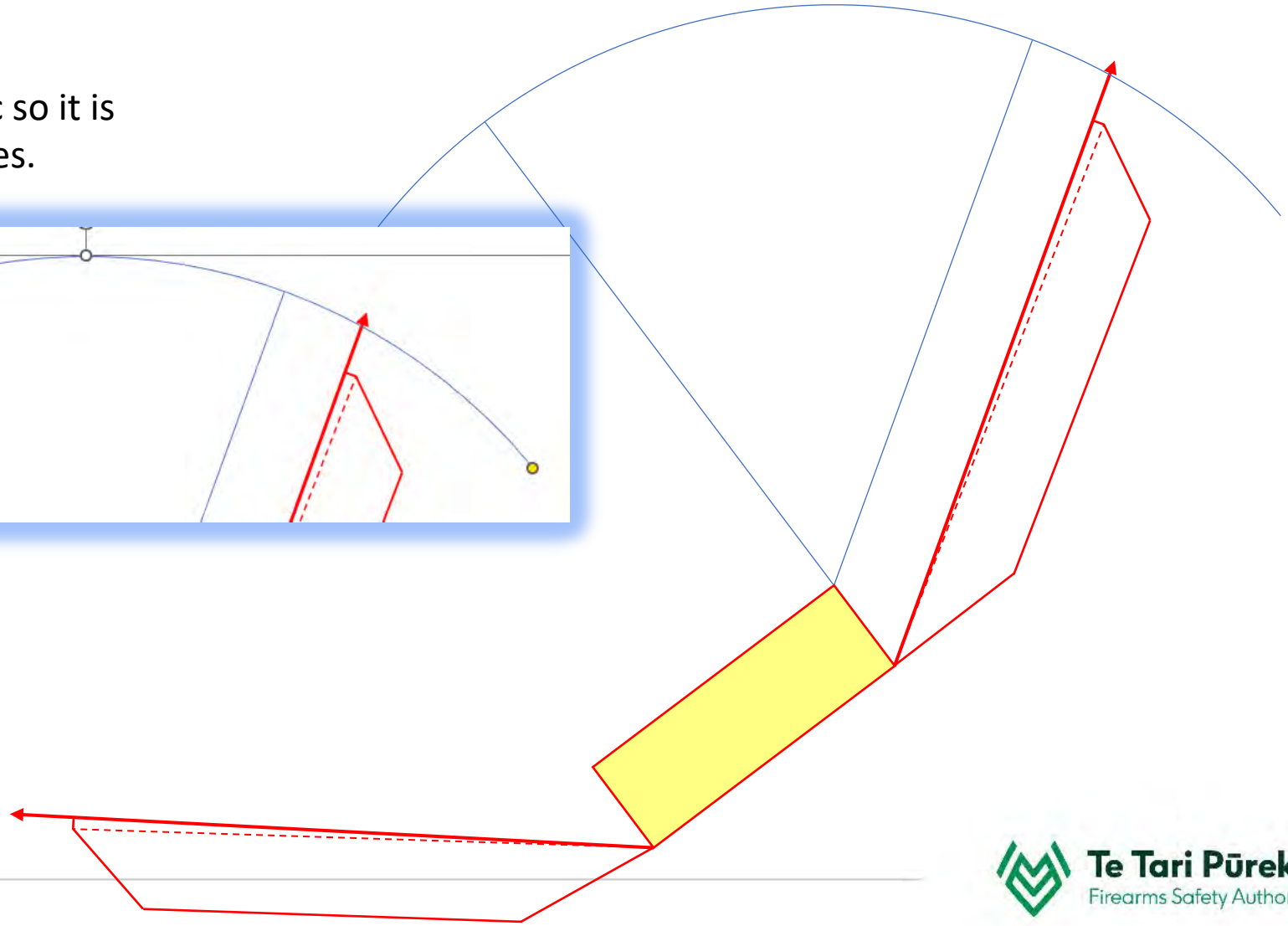
Manipulating the arc

Move both lines so they are touching the corner of the firing box.

Using the arrow keys, place the arc so it is touching the other end of both lines.



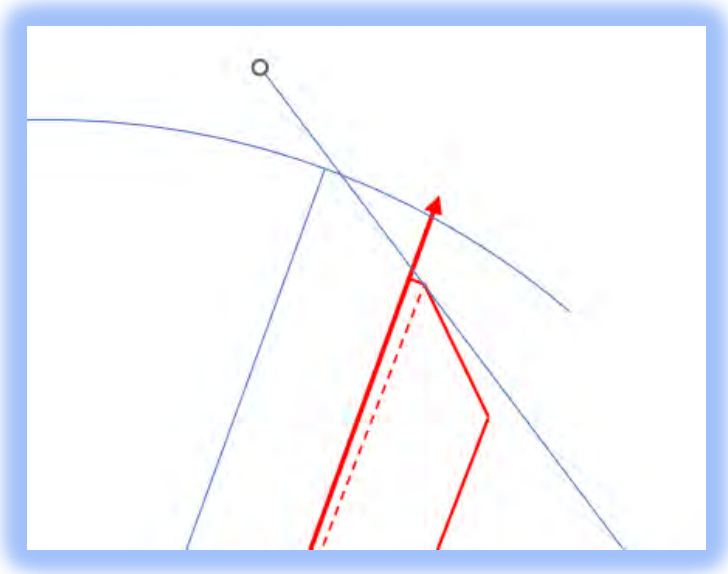


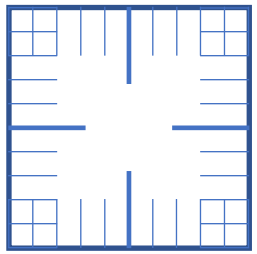


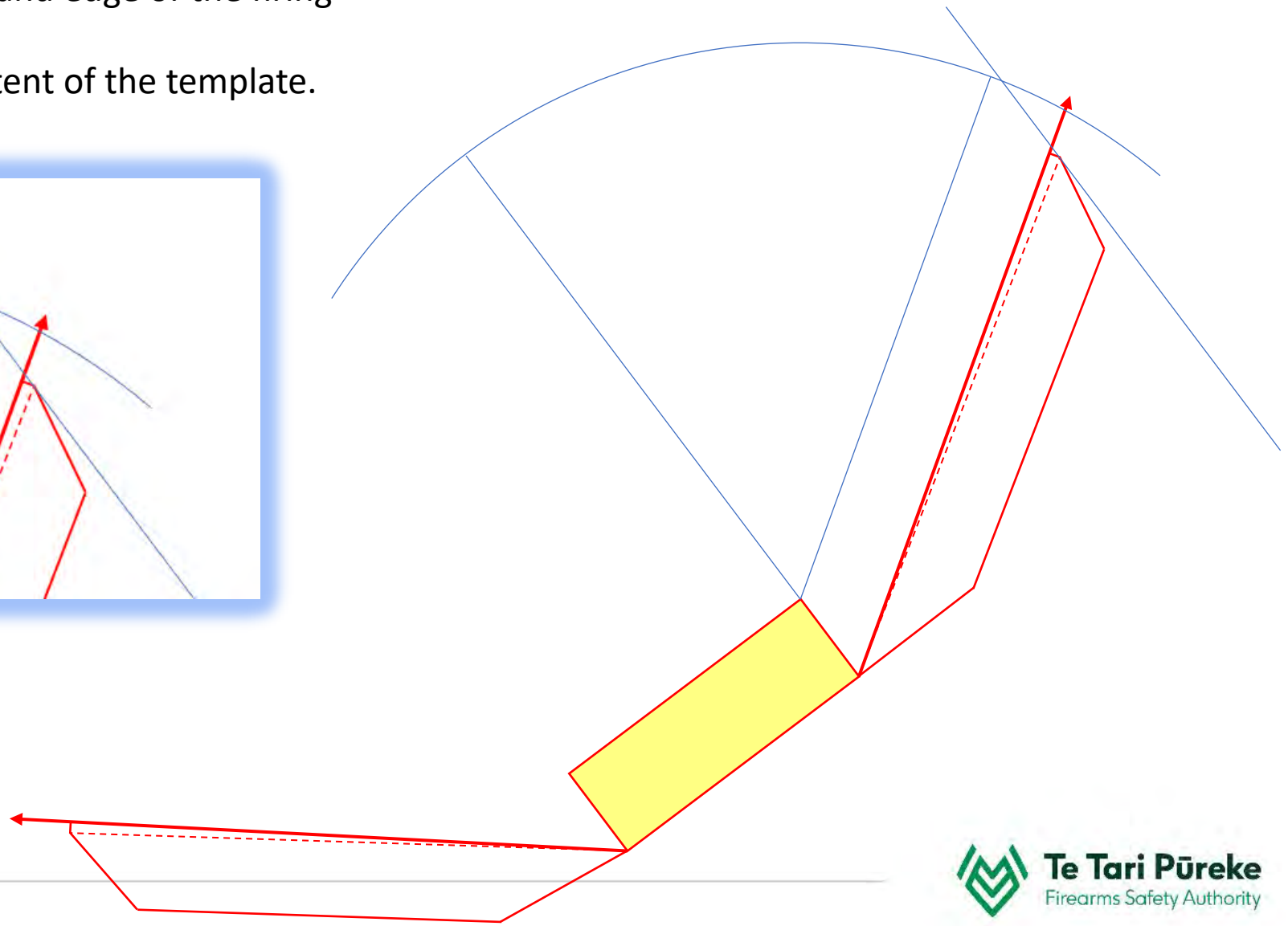
Parallel lines

Copy and paste the line on the right hand edge of the firing box.

Move that until it is at the furthest extent of the template.

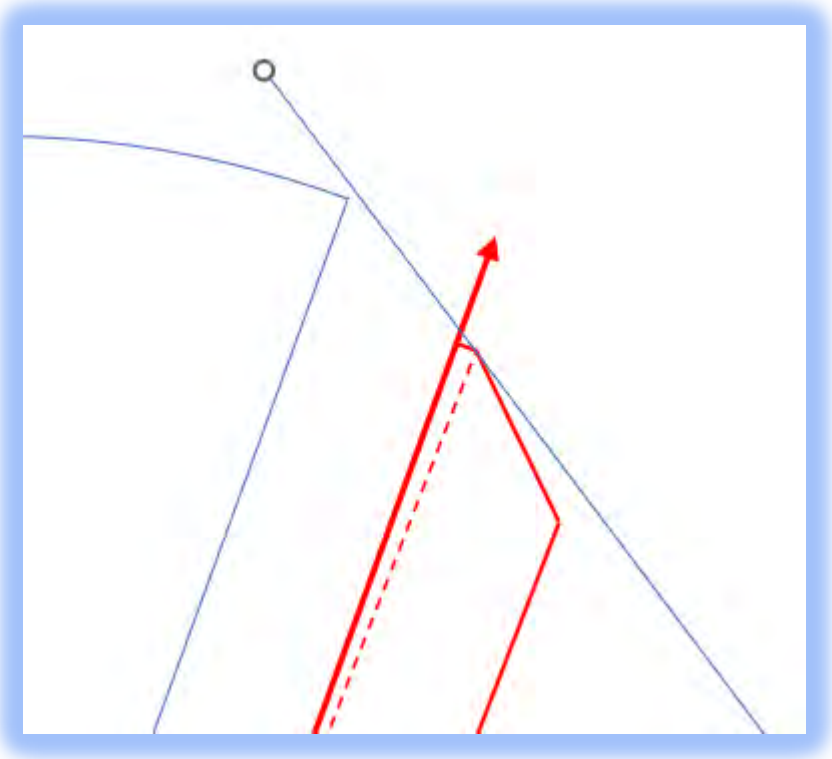


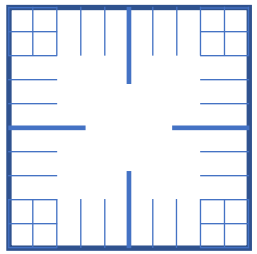


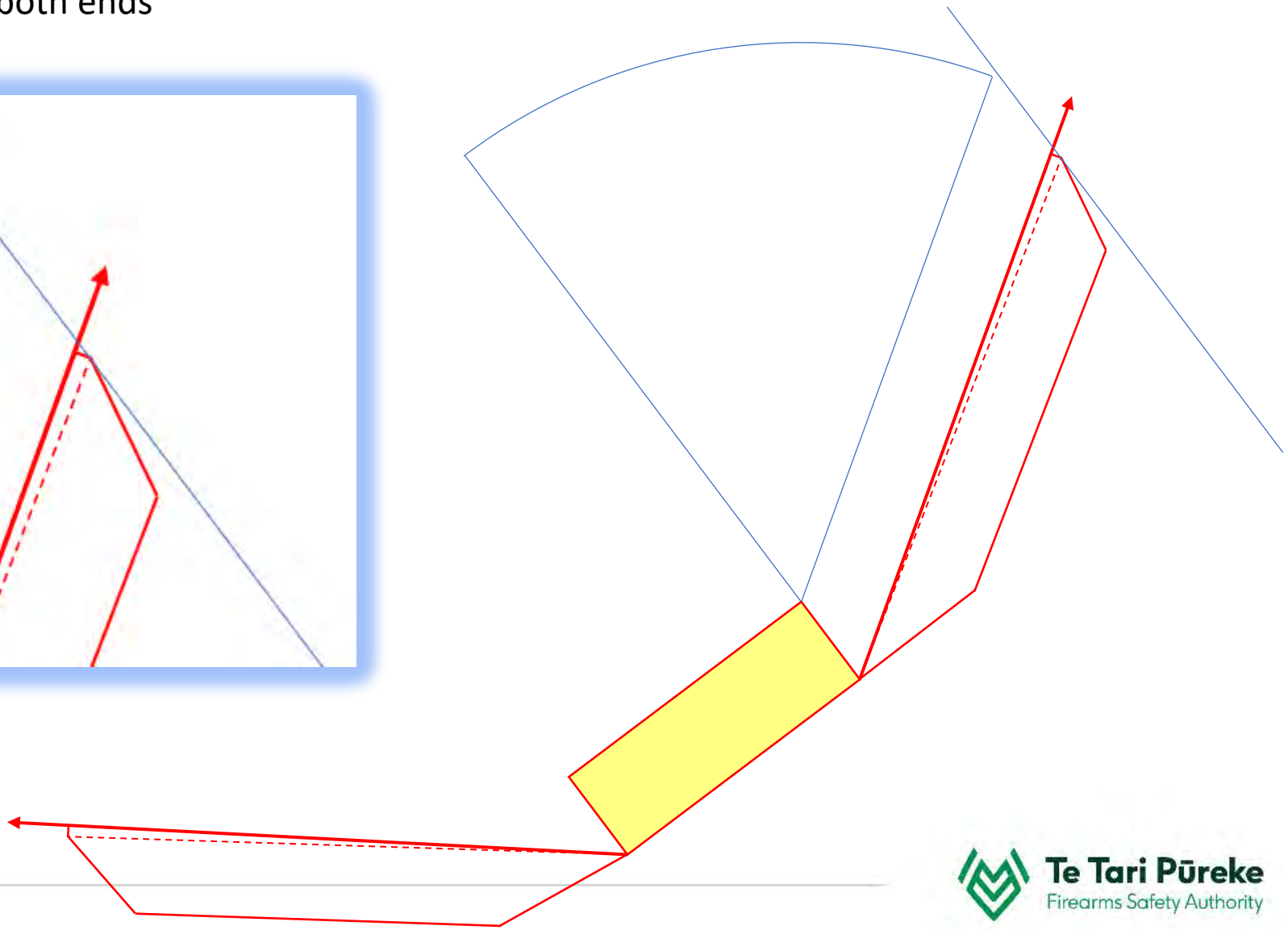


Adjusting the arc

Click on the arc and make it touch both ends of the lines.





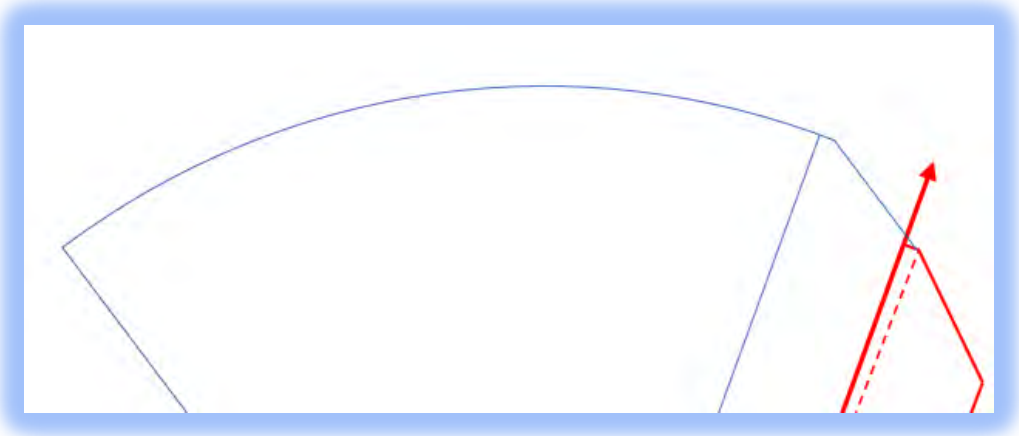


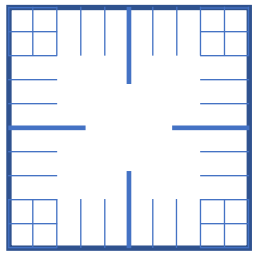
Using the arc and lines

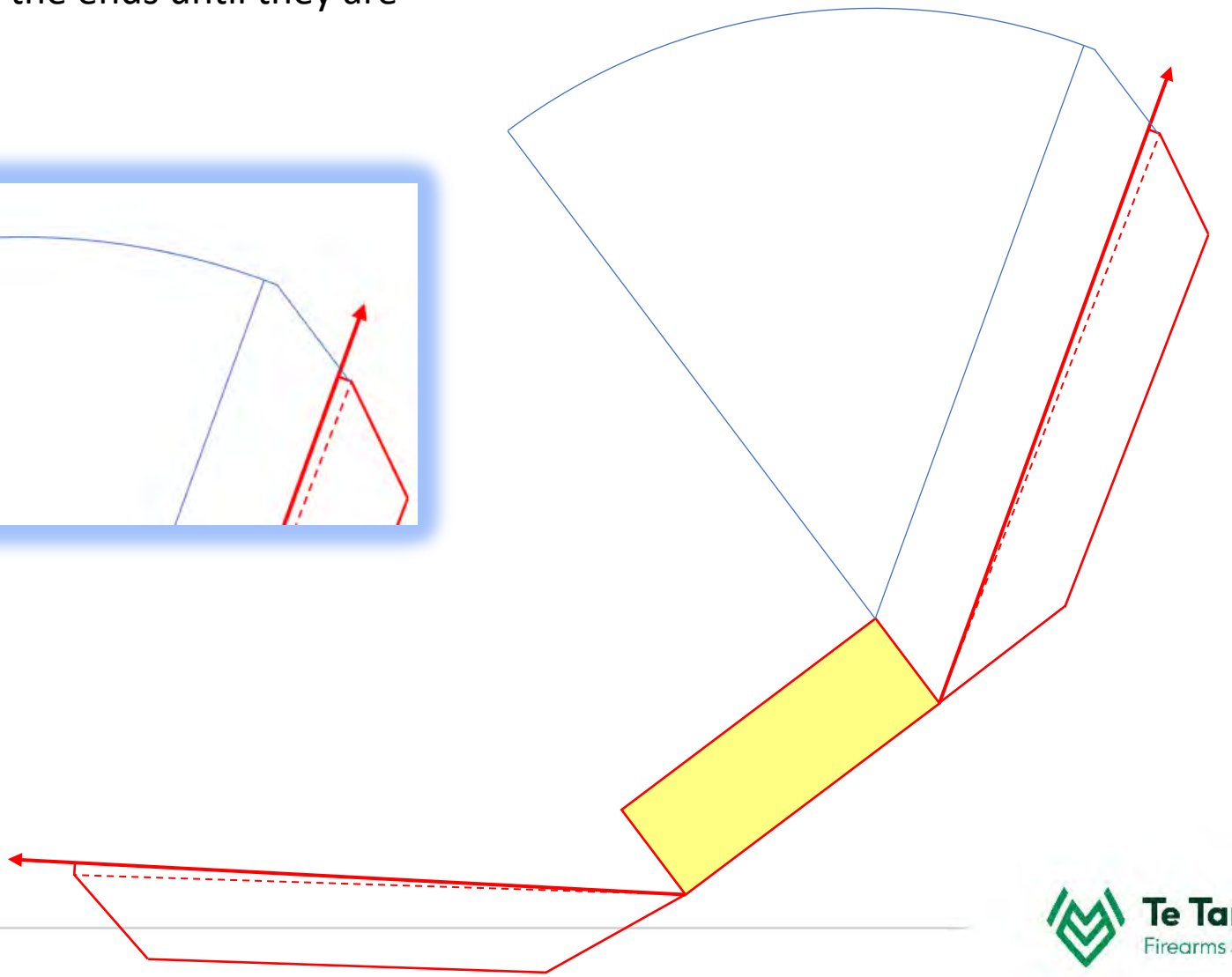
New we can ‘tidy up’ the lines.

Click on the line (hold Shift) and drag the ends until they are the correct length.

Do the same for the arc.







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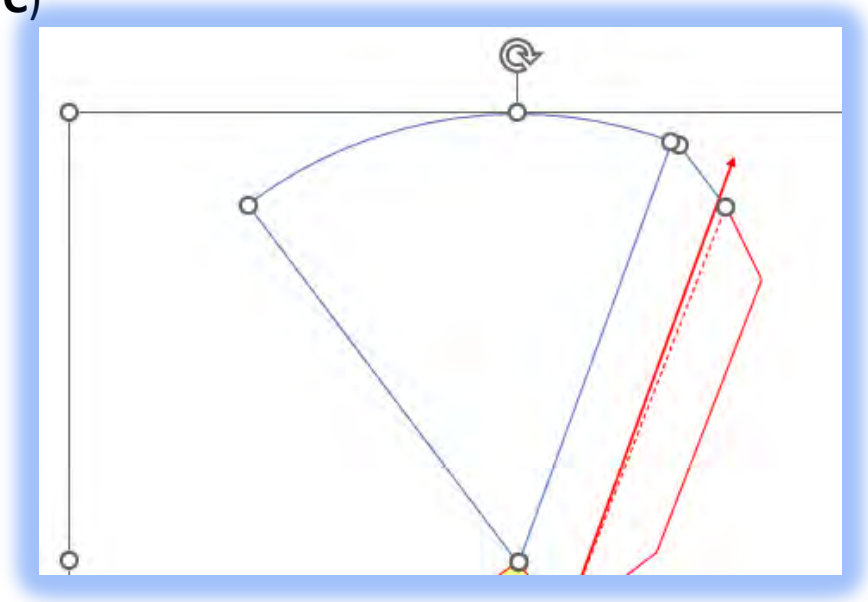
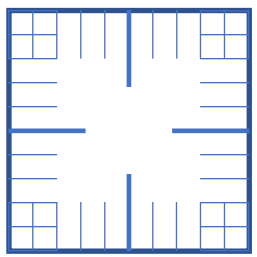
Left of arc (LOA)

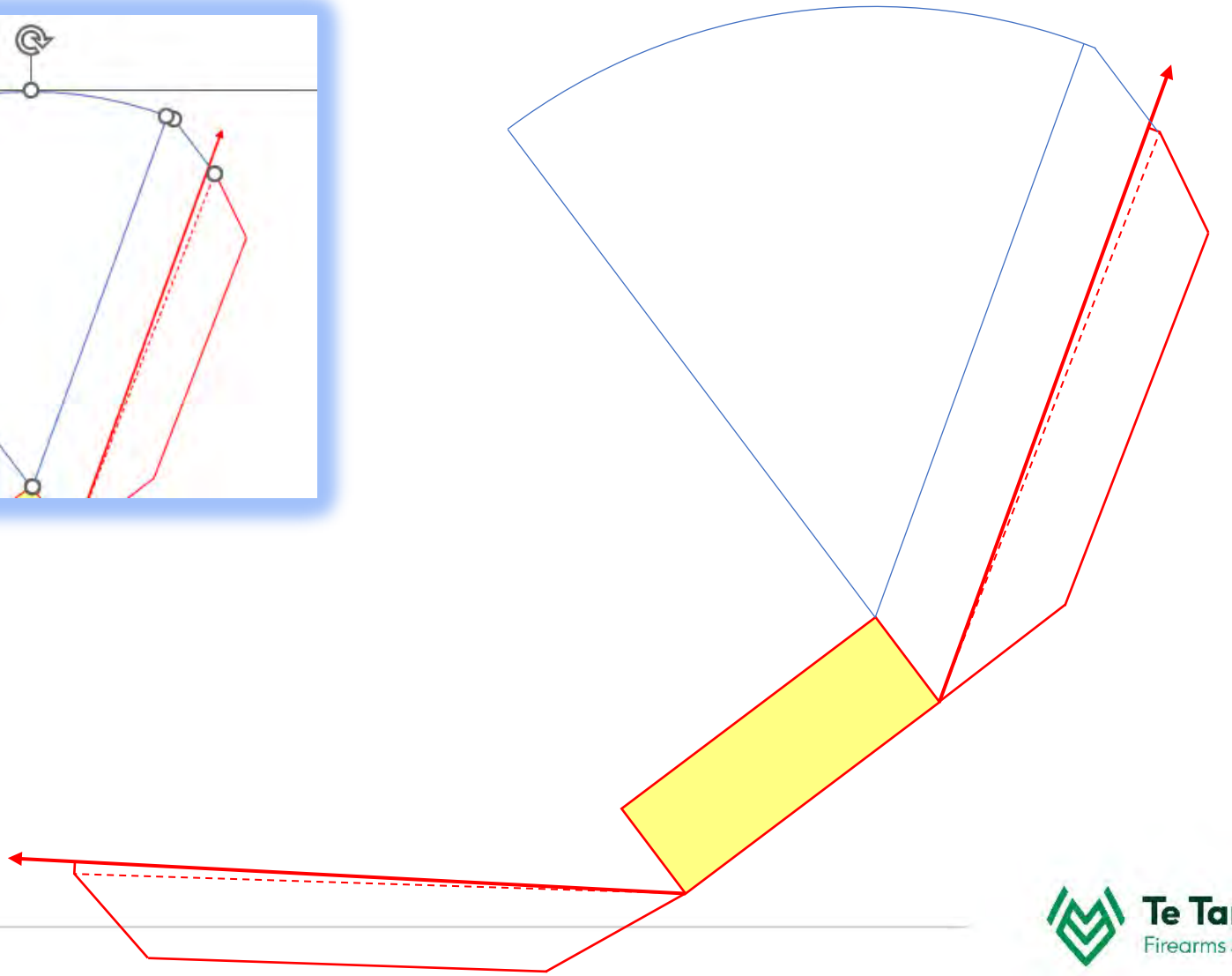
Arc and lines for the left side

Hold **Ctrl** and click on all the blue lines.

Copy (**Ctrl + C**)



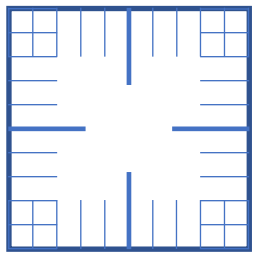


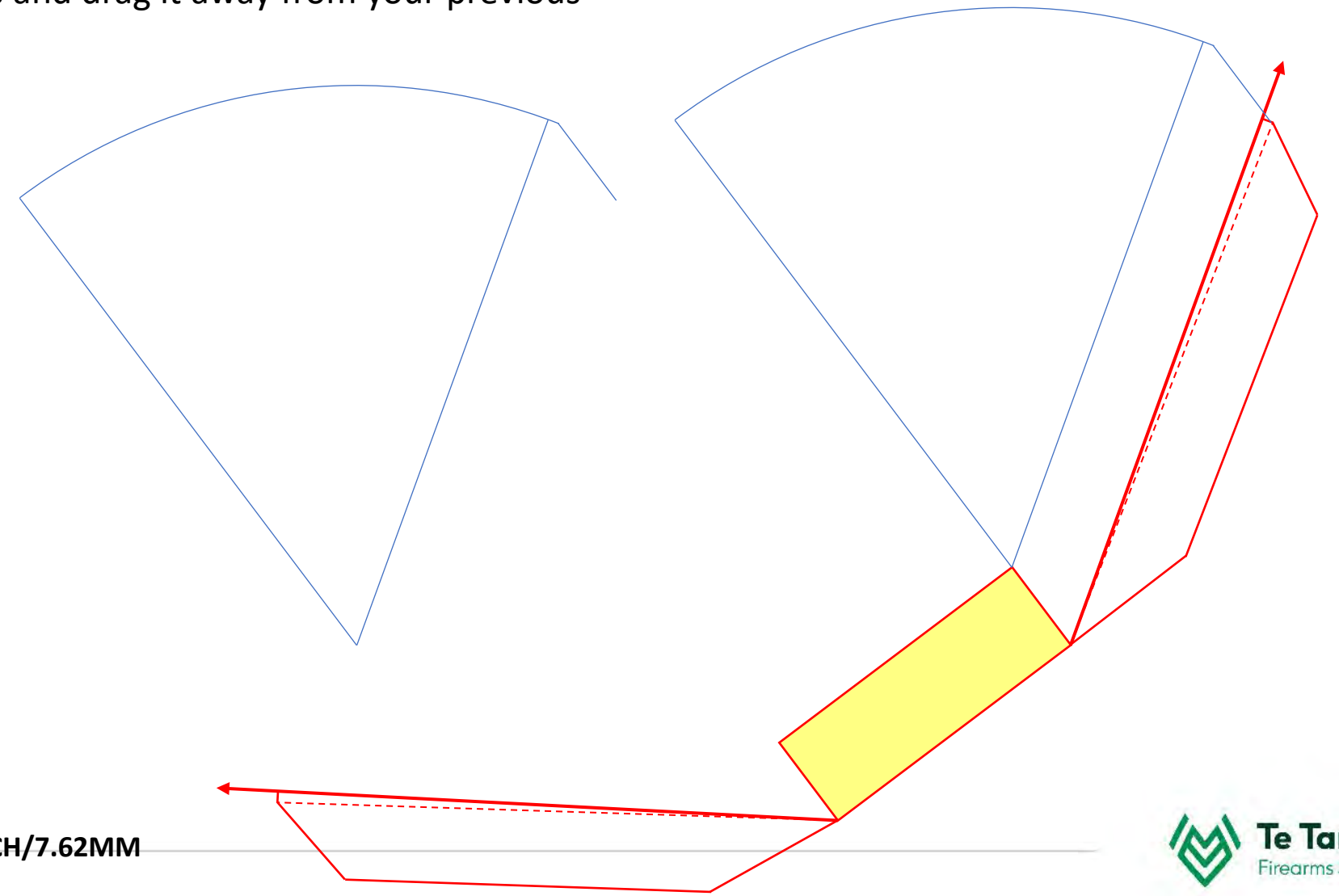


Arc and lines for the left side

Click somewhere else on the screen, **Ctrl+V** to paste.

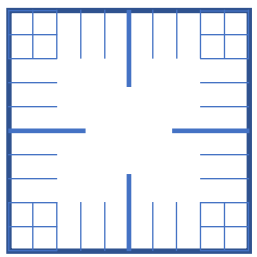
Click on one of the lines and drag it away from your previous work.

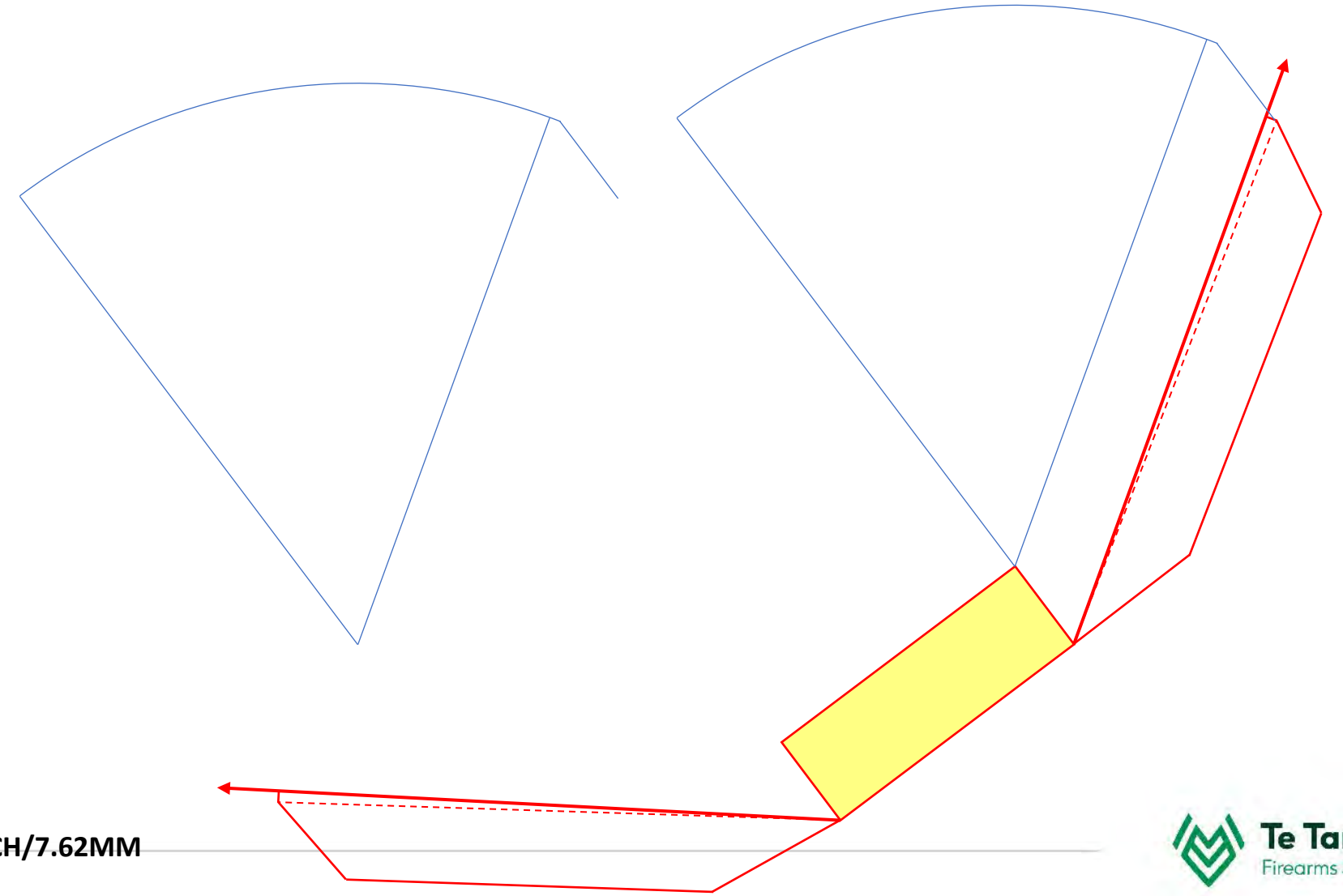




Arc and lines for the left side

Whilst all the lines are still selected, group the lines.

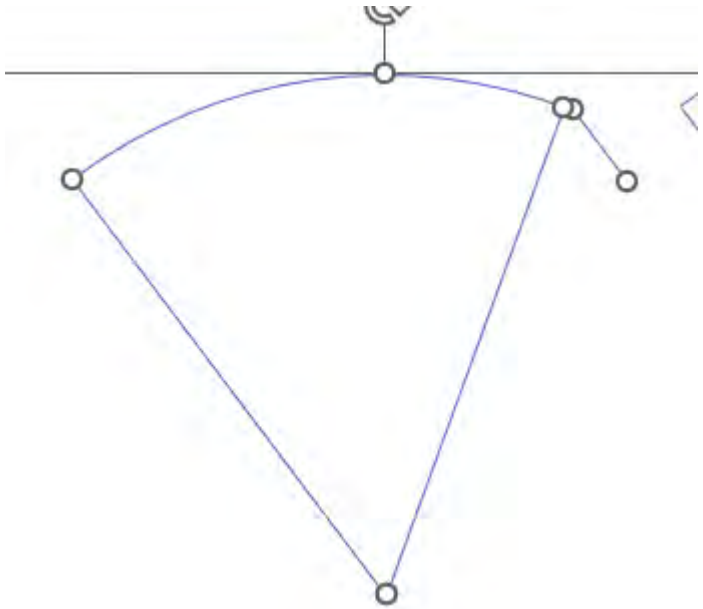




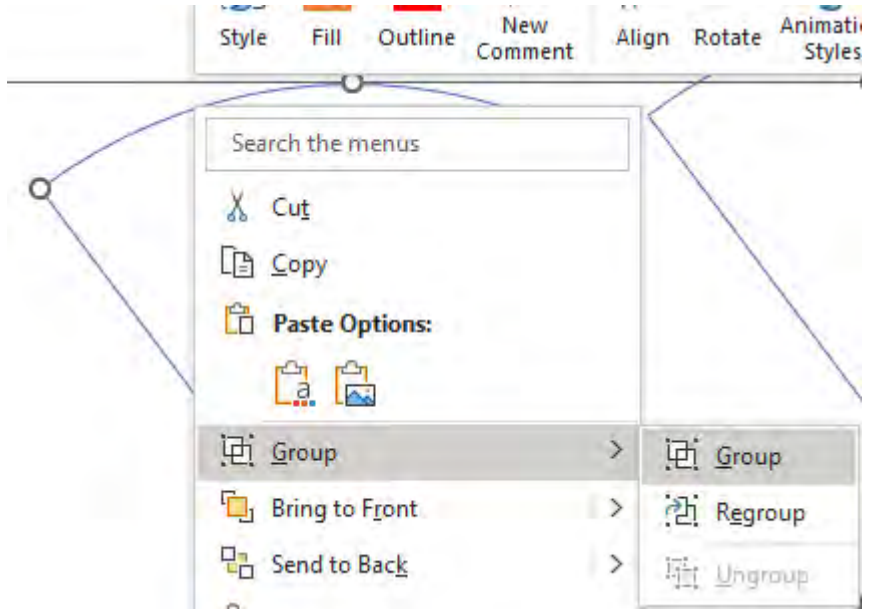
Grouping objects

Hold **Ctrl** down whilst clicking on all the objects you want to group.

Right click on a line and choose **Group** and then **Group** again



All the objects have been selected

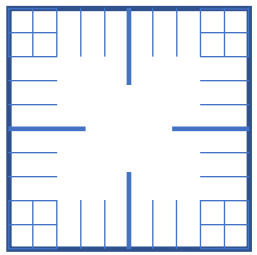


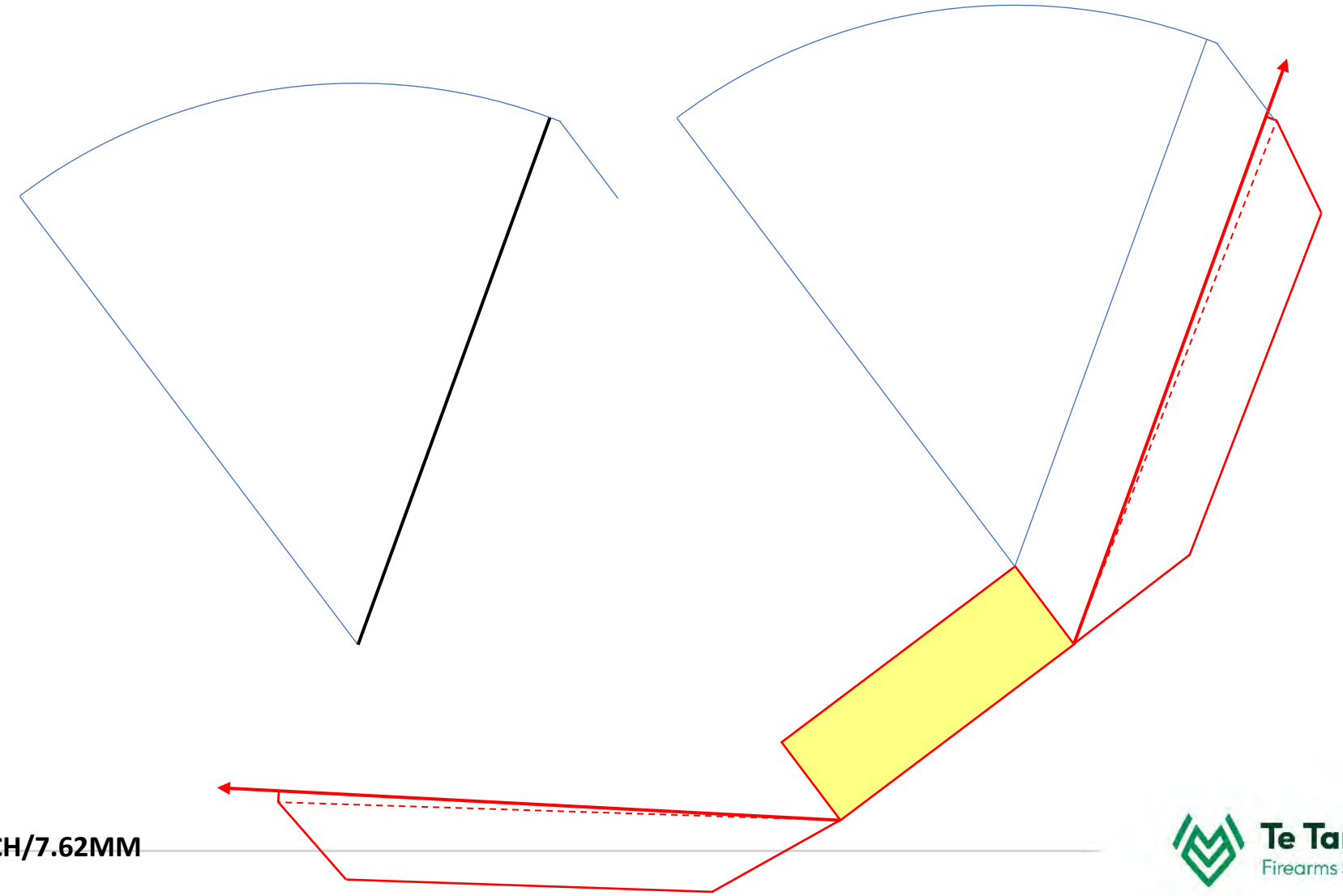
Right click on a line and choose **Group**

Arc and lines for the left side

The only line we can't reuse is the one coloured black.

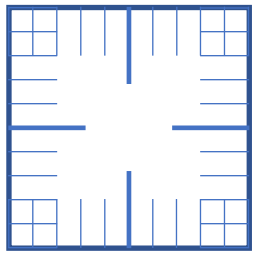
That can be deleted.

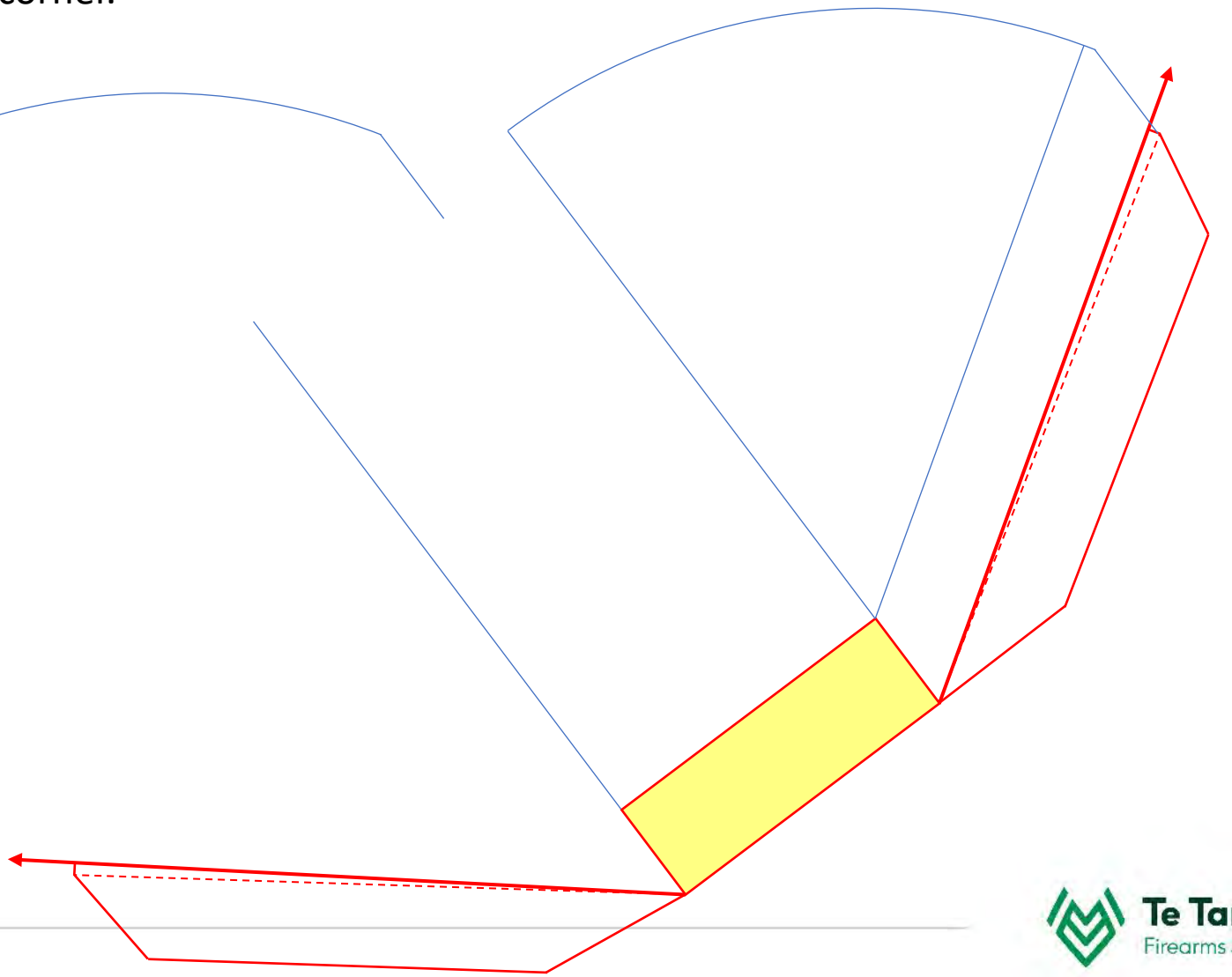




Arc and lines for the left side

Move the line that is parallel to the left side of the firing box to the correct position on the front left corner.

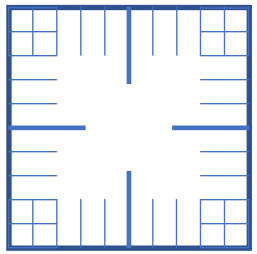




Arc and lines for the left side

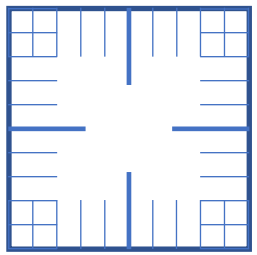
Rotate the line we stored on the left of the page to the correct angle for the left side of the firing box and place it on the front left corner.

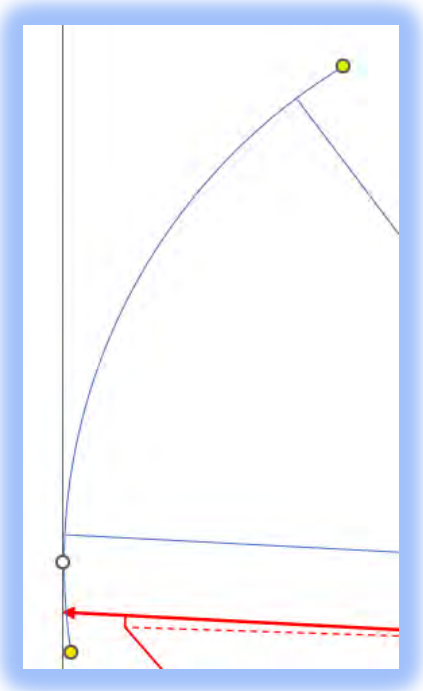
In this case it was 273^0

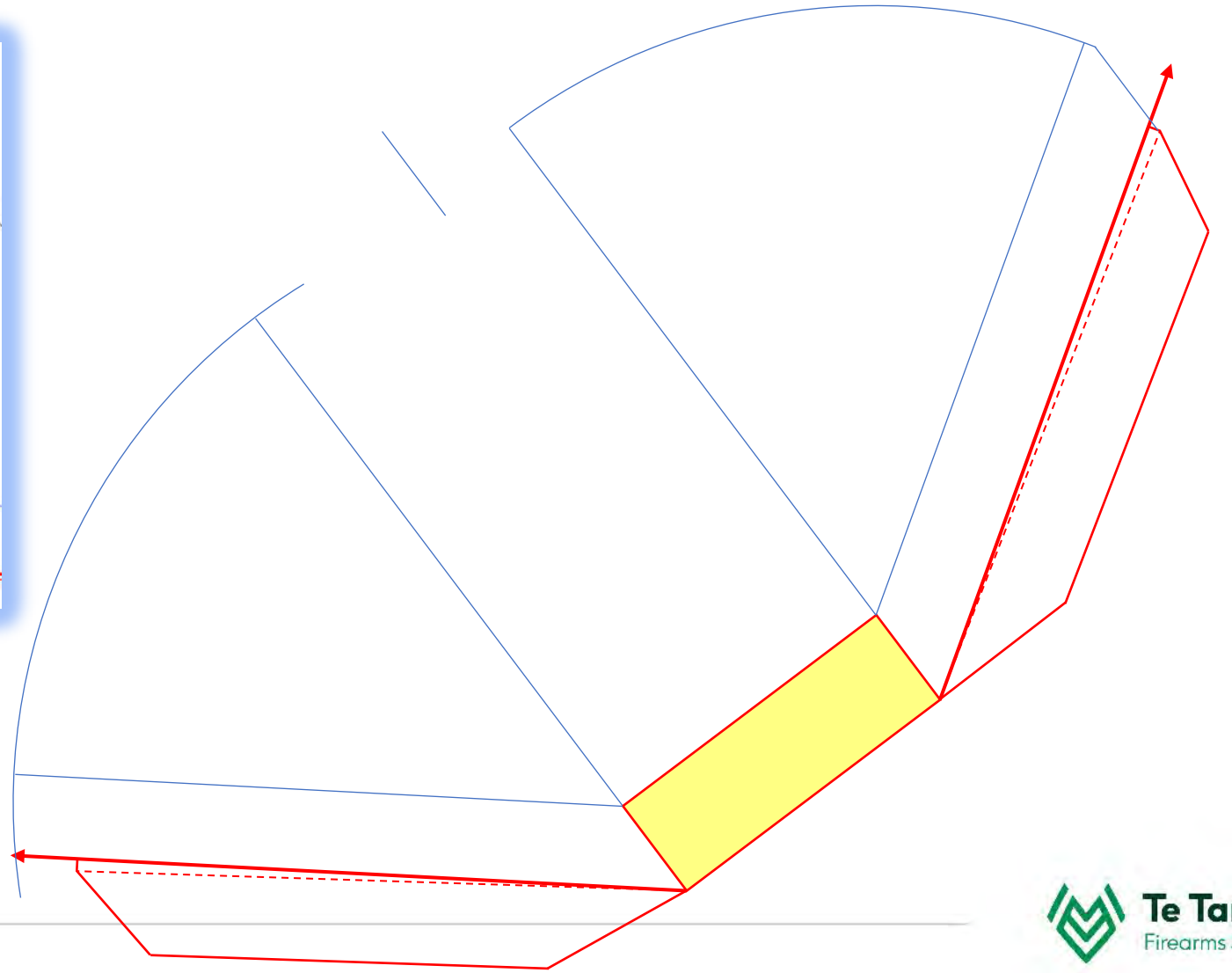


Arc and lines for the left side

Position the arc as previously done



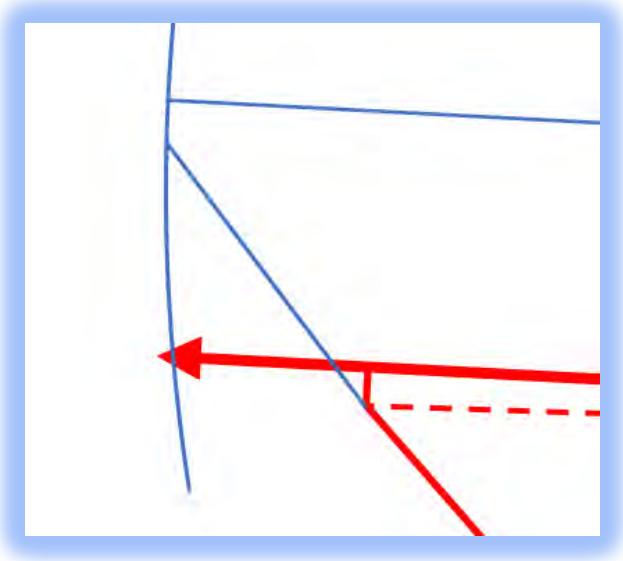


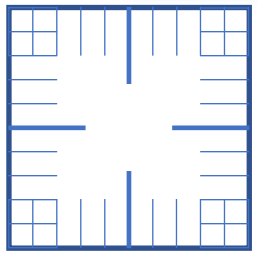


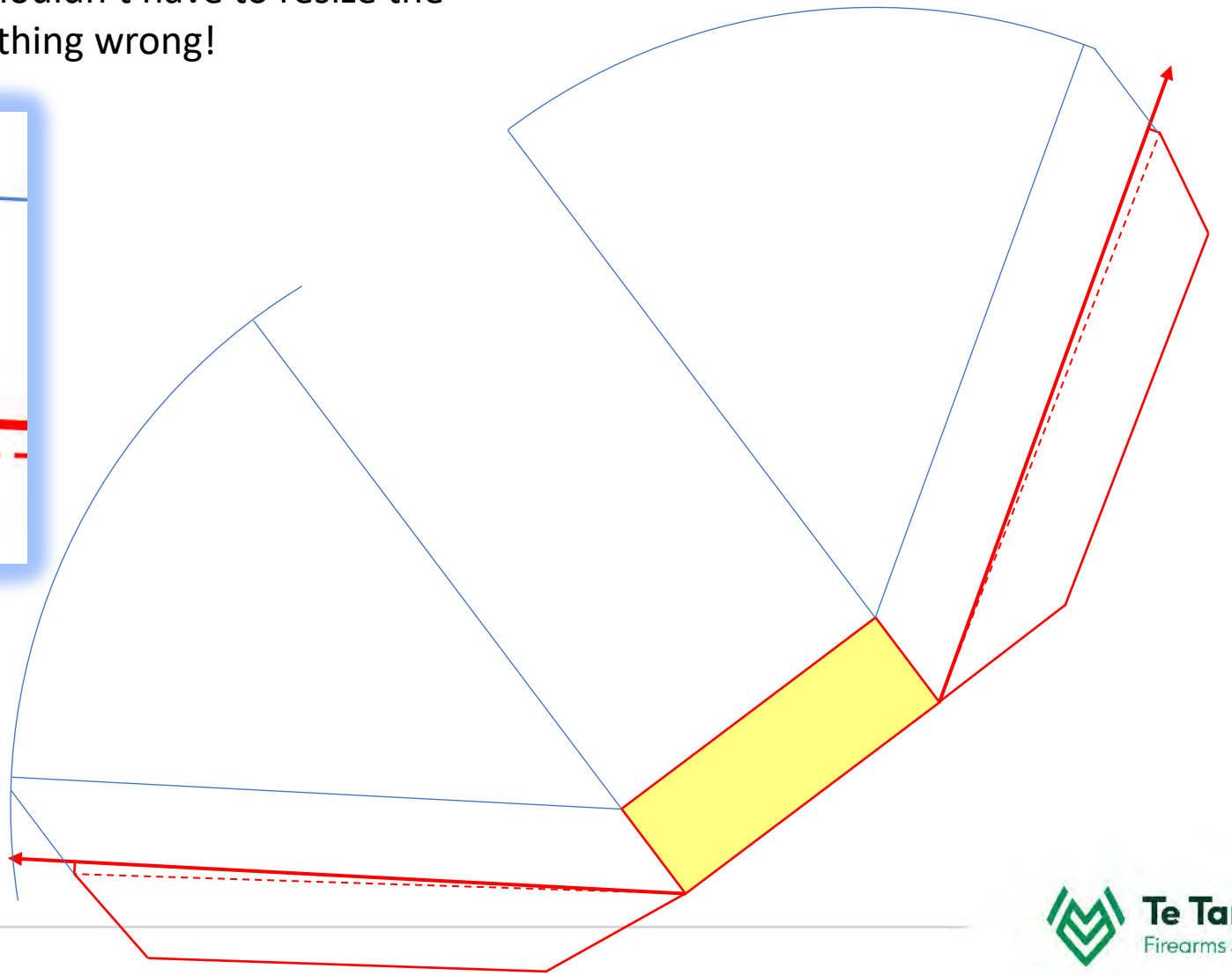
Arc and lines for the left side

Move the last line into position on the left hand side.

If everything has gone to plan, you shouldn't have to resize the line. If it doesn't fit…… There's something wrong!



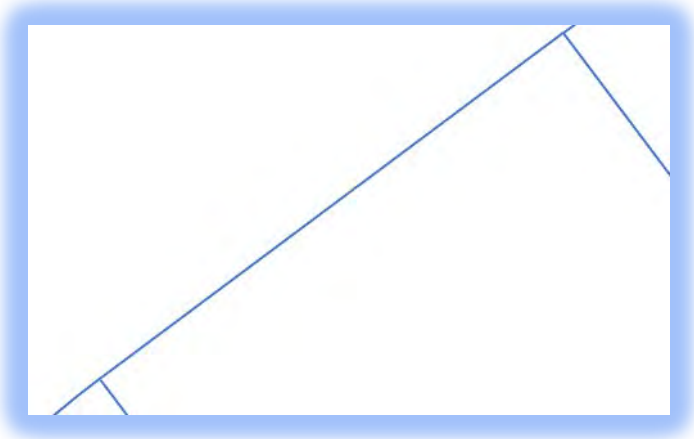


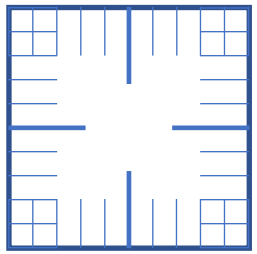


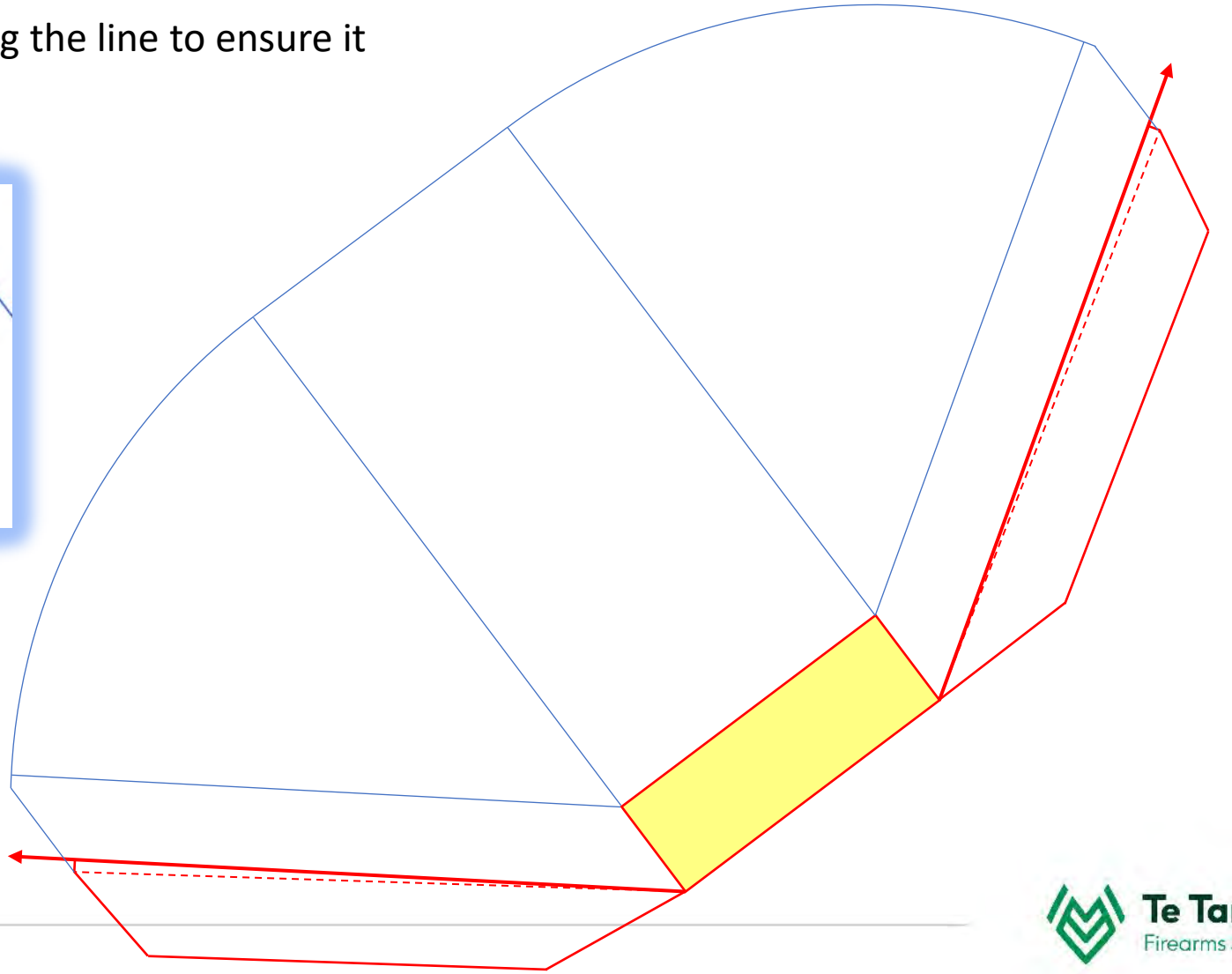
Arc and lines for the left side

Tidy up the ends of the arc and add a line to join the two arcs together.

Remember to hold **Crtl** whilst drawing the line to ensure it snaps to the ends of the arcs.







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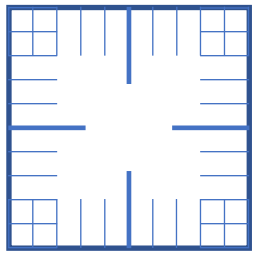
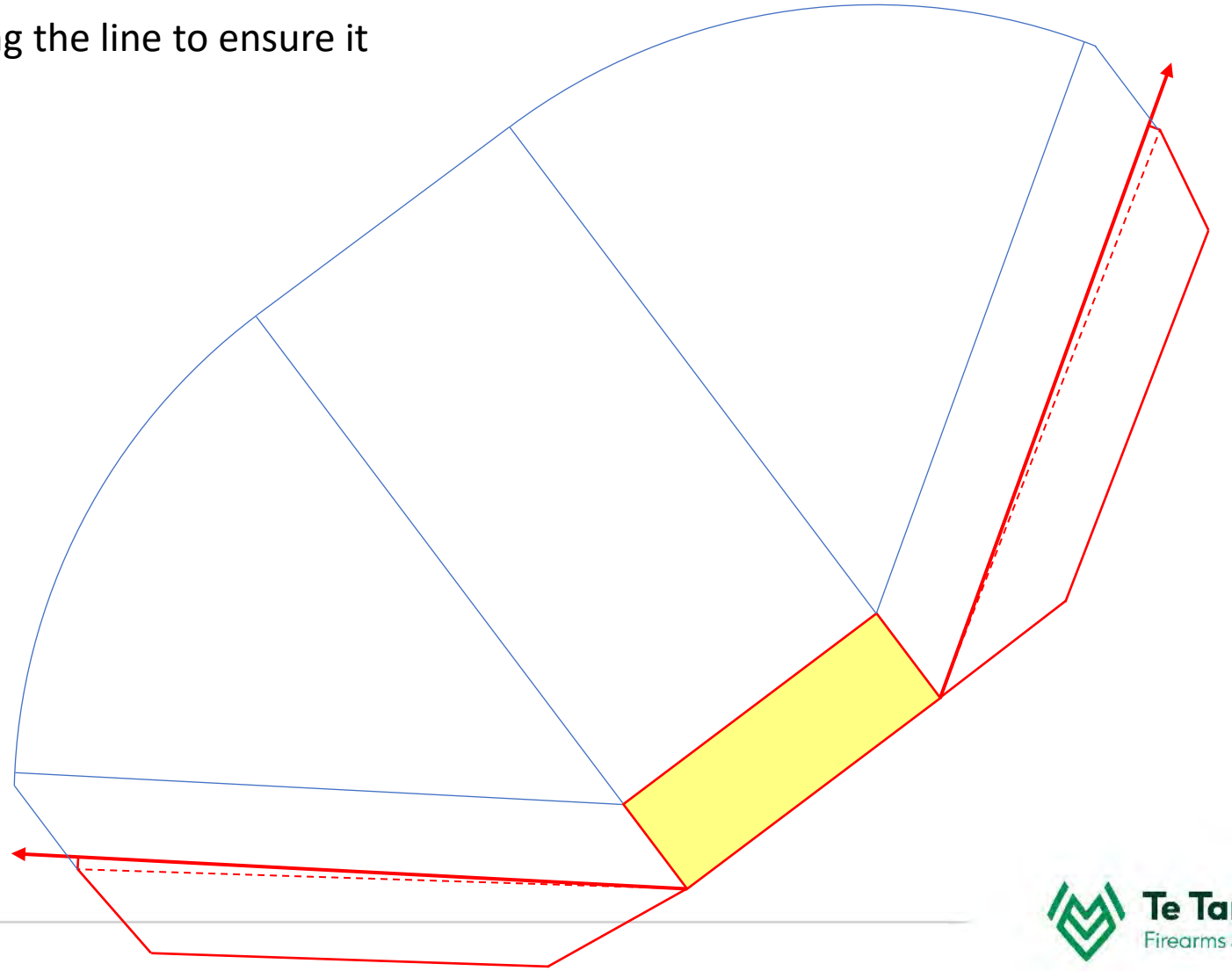
Completing the template

Arc and lines for the left side

Tidy up the ends of the arc and add a line to join the two arcs together.

Remember to hold **Crtl** whilst drawing the line to ensure it snaps to the ends of the arcs.

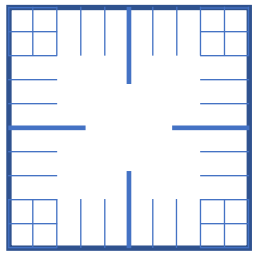


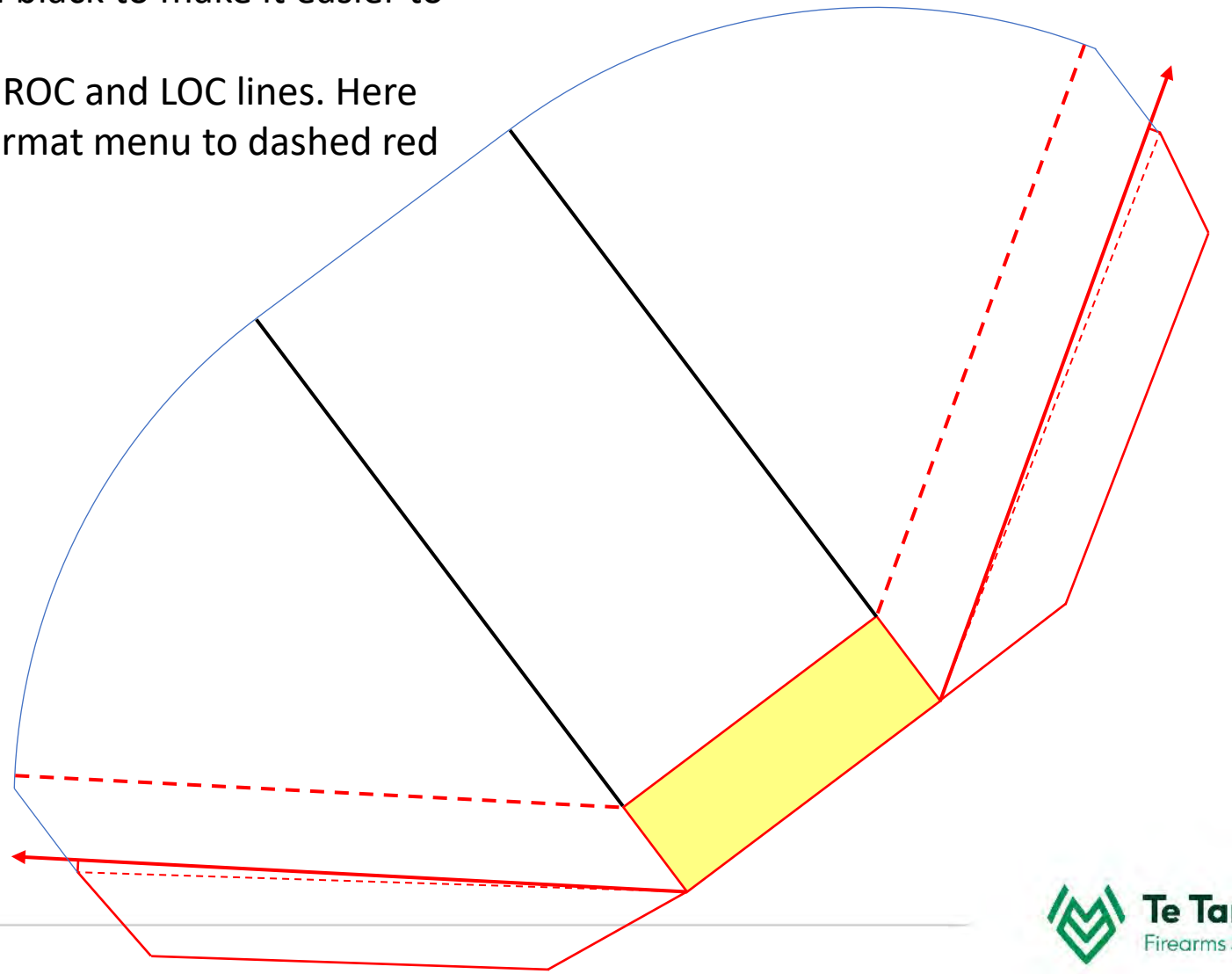


Remove unwanted lines

The inside lines are not required on the template. Select them and delete. They have been coloured black to make it easier to see.

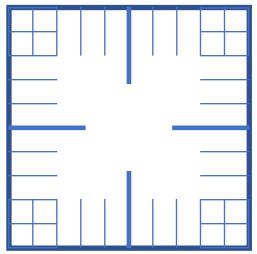
However, we do require the forward ROC and LOC lines. Here they have been changed using the format menu to dashed red lines.

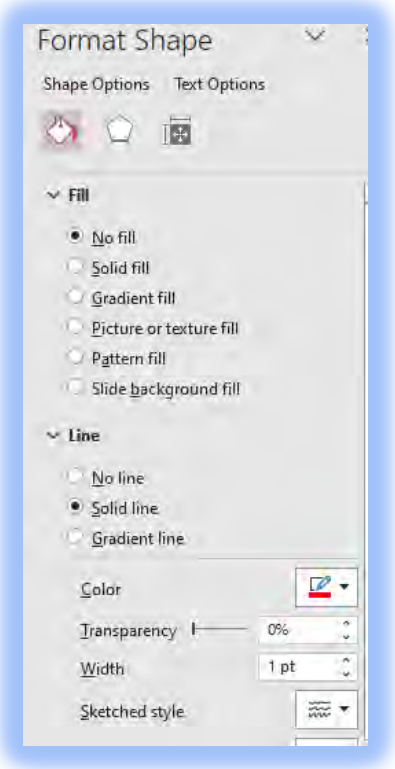


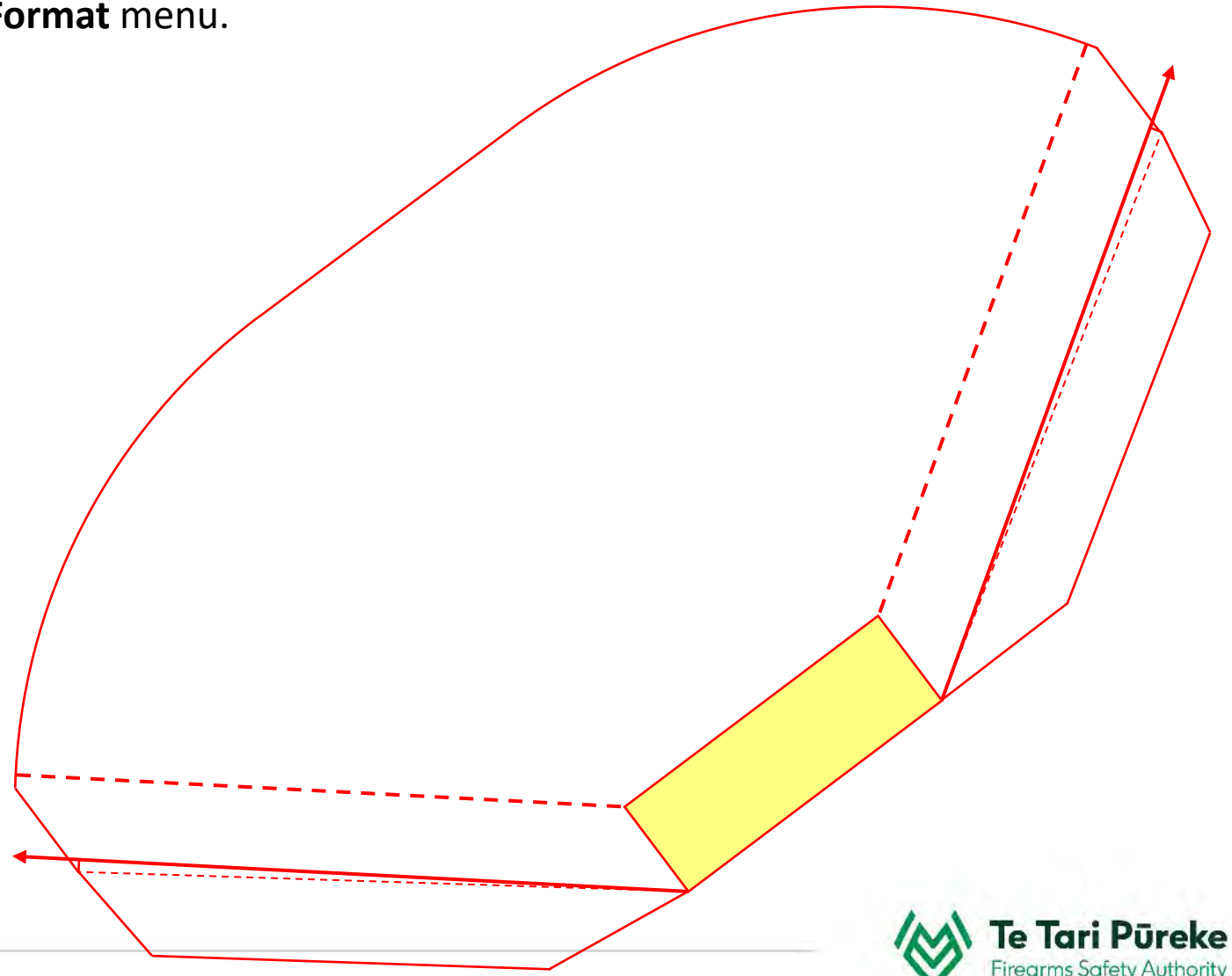


Changing line colour

The blue lines don’t stand out well on a map. I selected them and changed the colour and thickness in the **Format** menu.

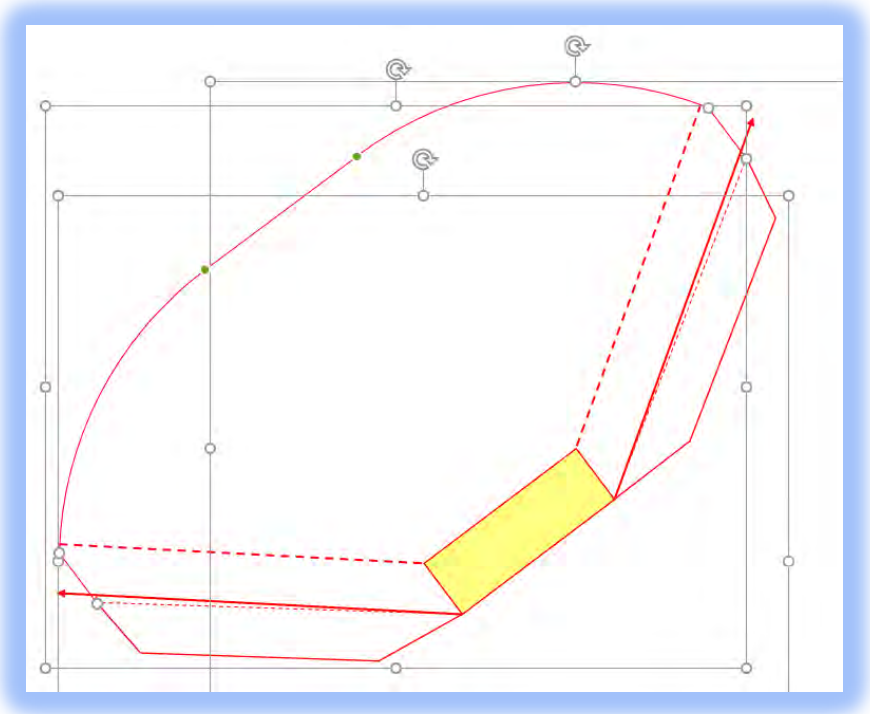




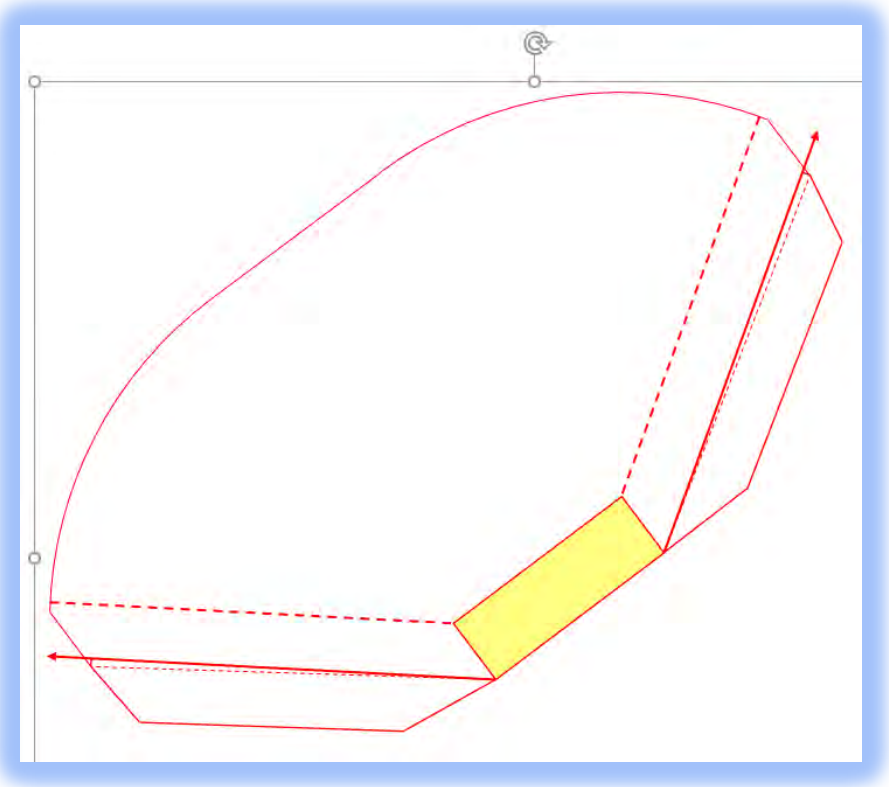


Grouping the template

Either hold down **Ctrl+A** (select all) or click and drag over all the objects. Right click on a line and choose **Group**.



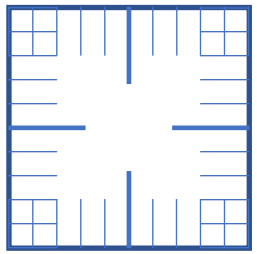
Objects being selected.

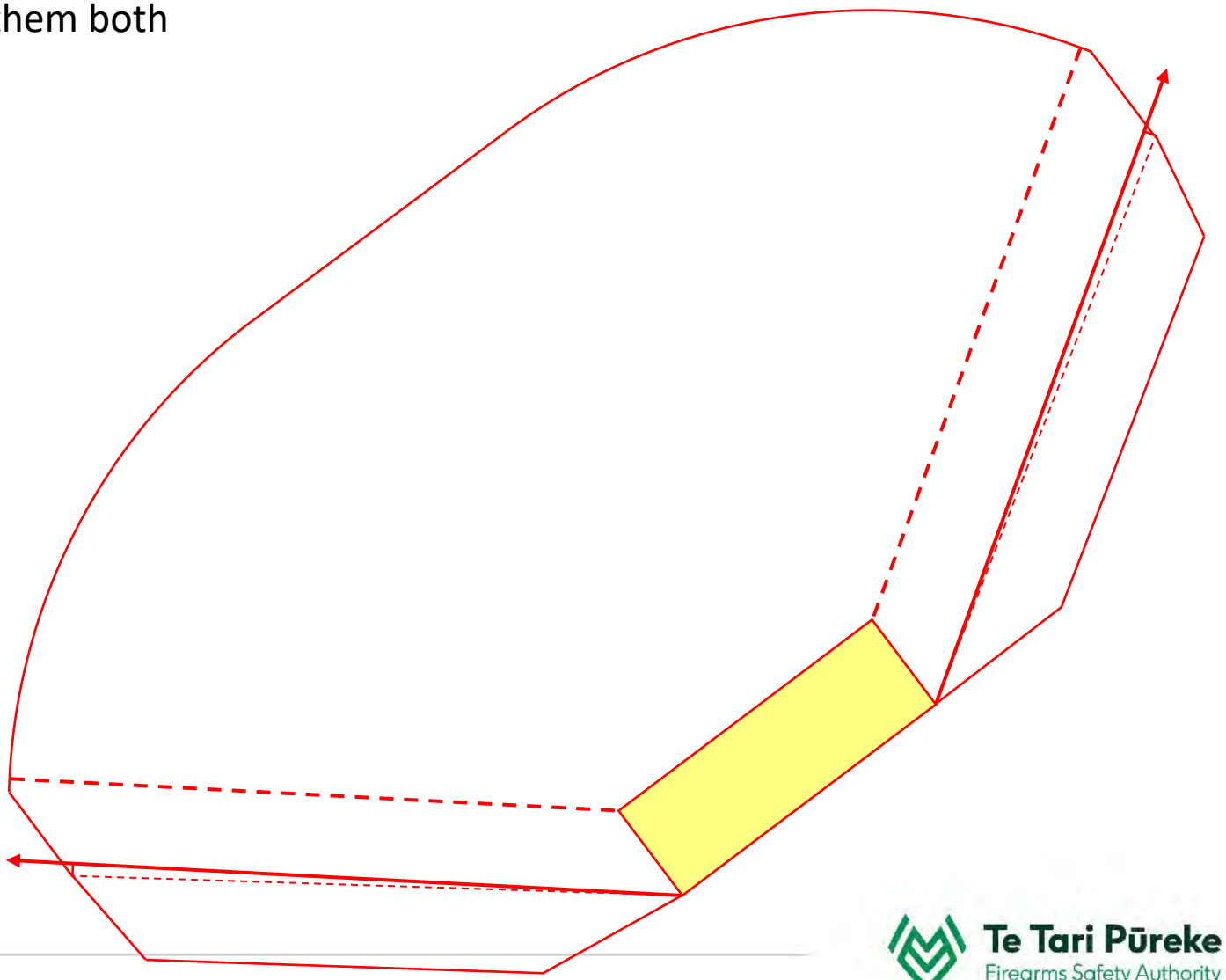


All the objects are now one item.

Applying the template

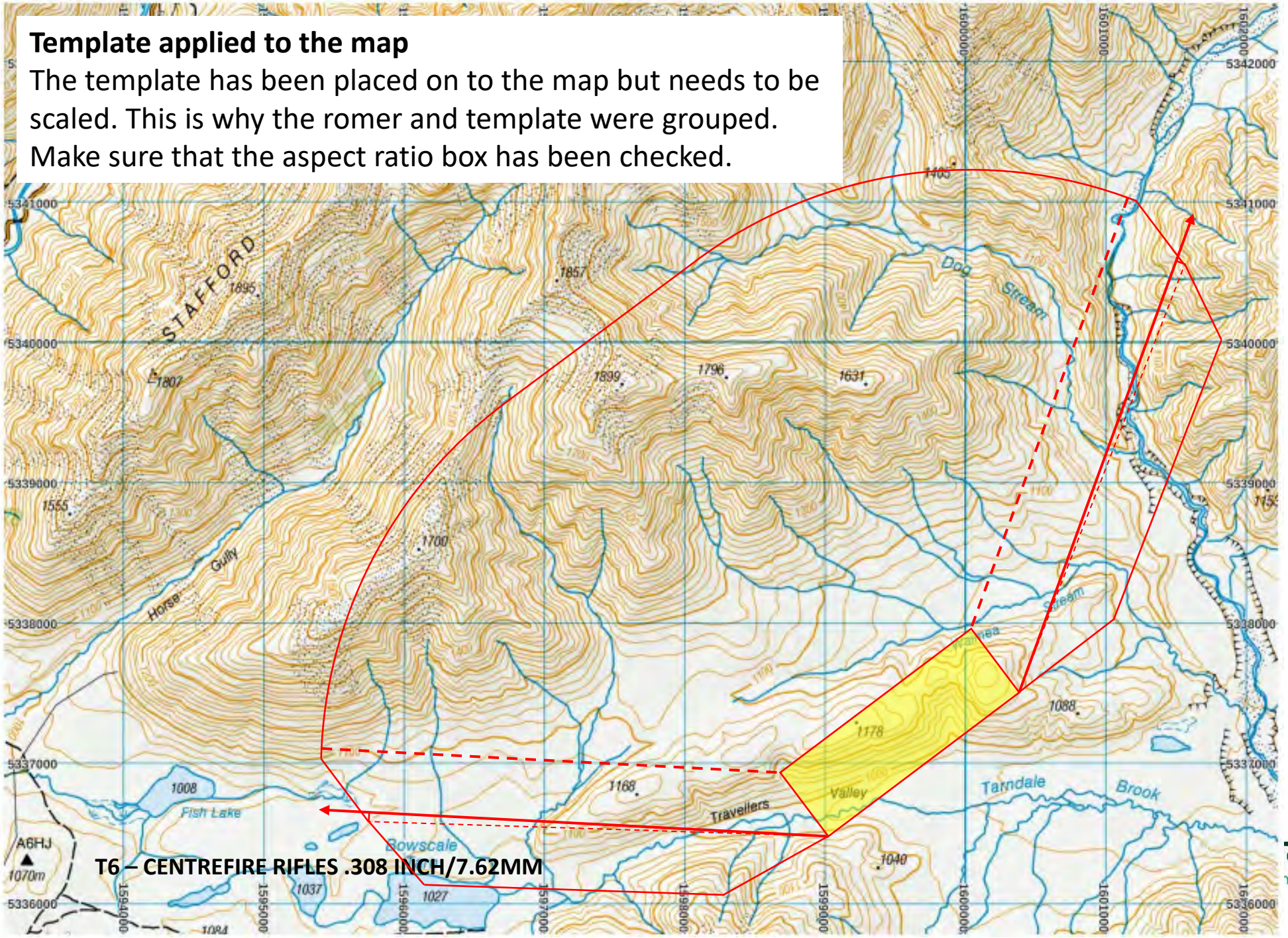
Once the template has been made into one object, select the template **and** the romer and make them both into one object





Template applied to the map

The template has been placed on to the map but needs to be scaled. This is why the romer and template were grouped. Make sure that the aspect ratio box has been checked.



T6 – CENTREFIRE RIFLES .308 INCH/7.62MM

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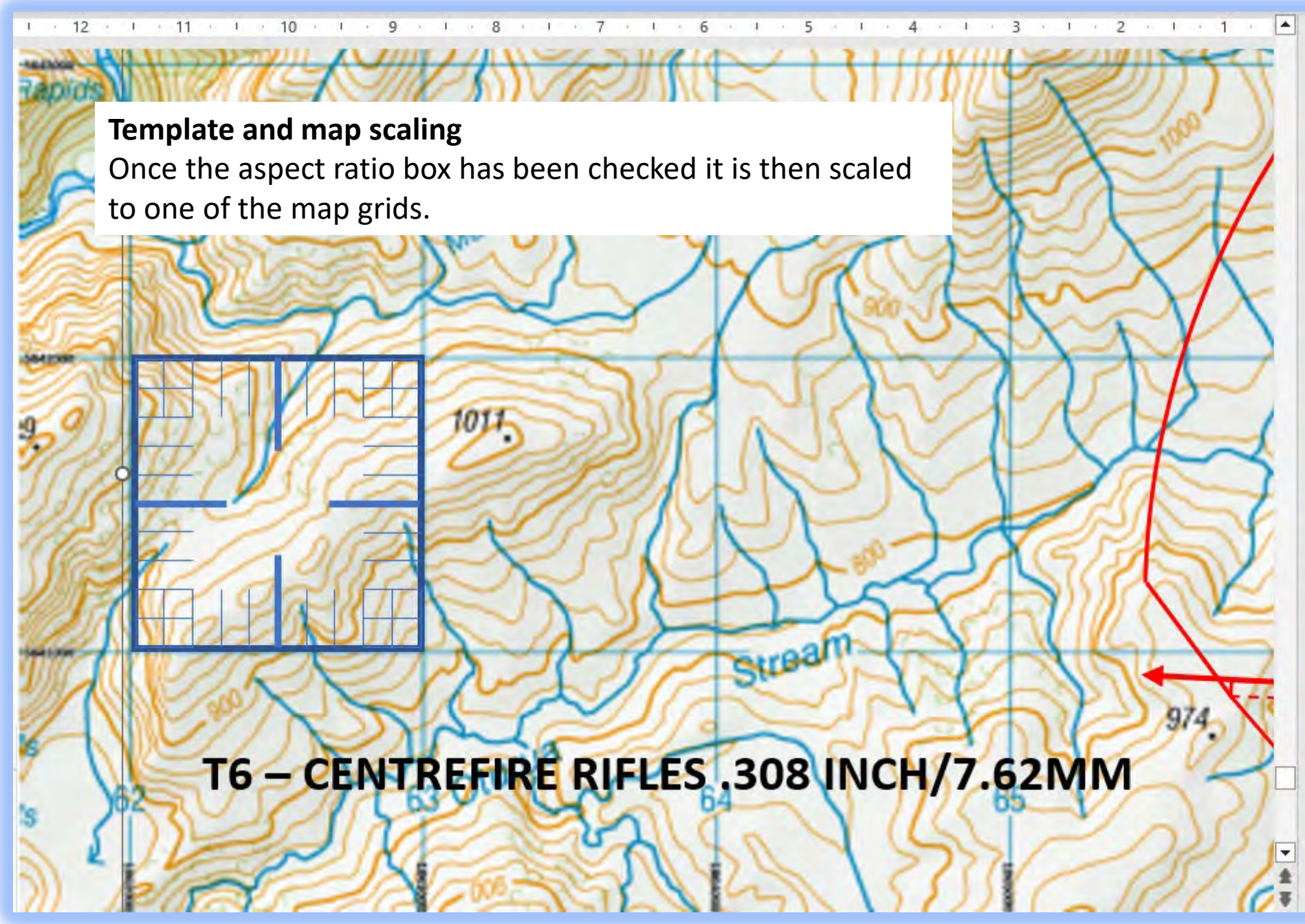
Template and map scaling

Once the aspect ratio box has been checked it is then scaled to one of the map grids.



Format Shape

Shape Options | Text Options

Size
- Height: 18.46 cm
- Width: 28.8 cm
- Rotation: 0°
- Scale Height:
- Scale Width:
- Lock aspect ratio
- Relative to original picture size
- Best scale for slide show
- Resolution: 640 x 480

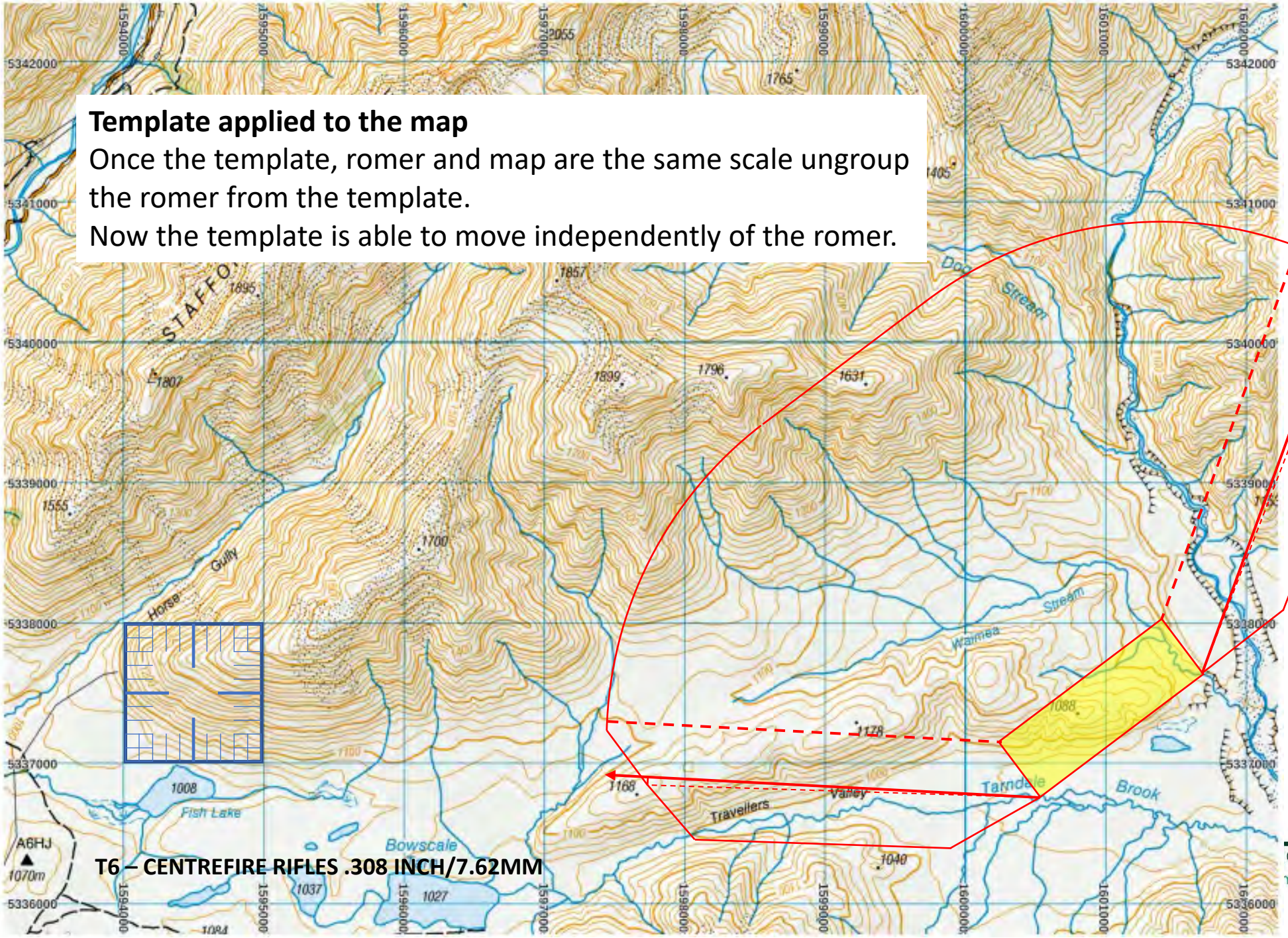
Position
- Horizontal position: 5.47 cm
- From: Top Left Corner
- Vertical position: 5.42 cm
- From: Top Left Corner

Text Box
- Vertical alignment: Middle
- Text direction: Horizontal
- Do not Autofit

Template applied to the map

Once the template, romer and map are the same scale ungroup the romer from the template.

Now the template is able to move independently of the romer.



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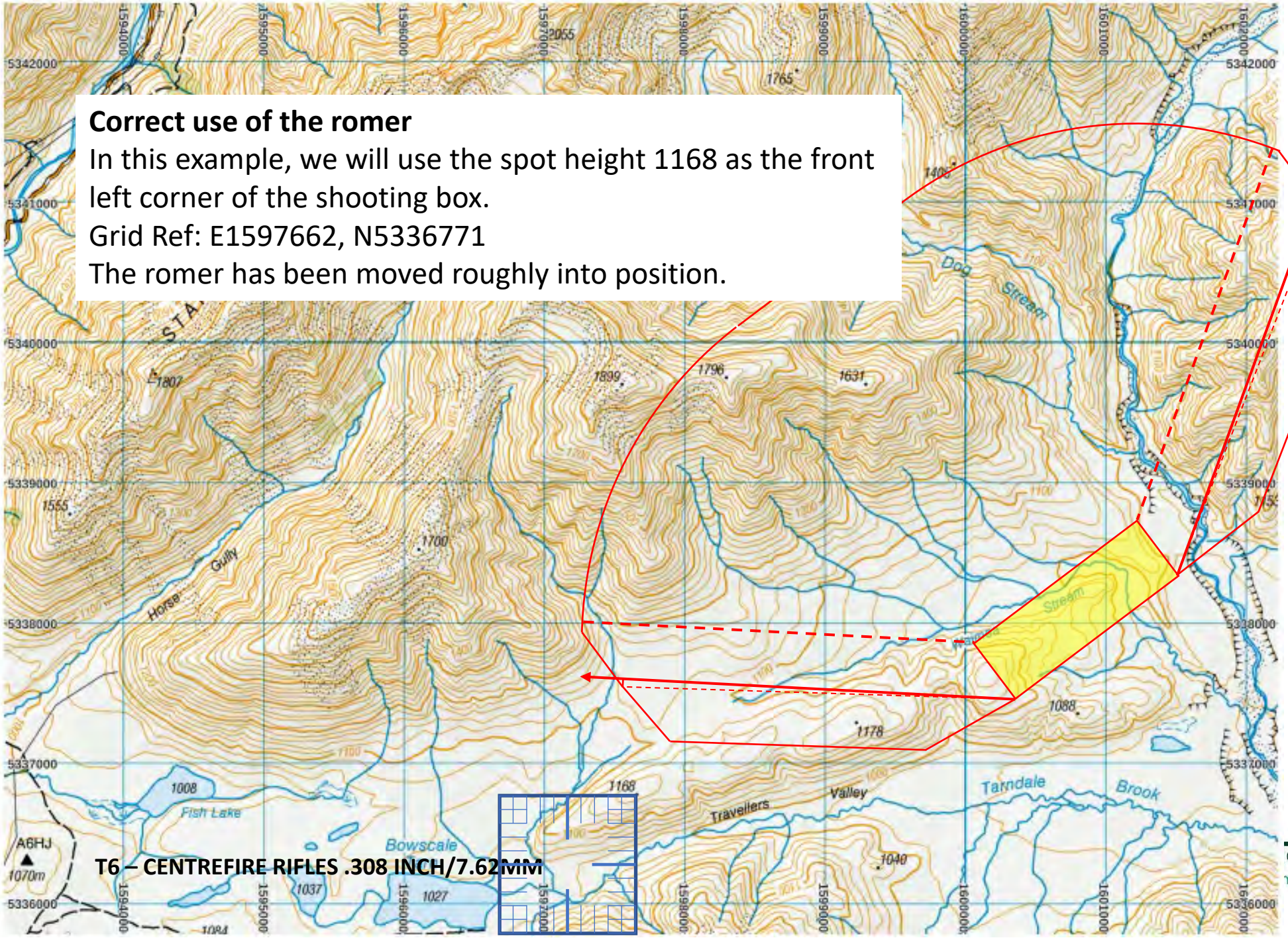
Using the romer



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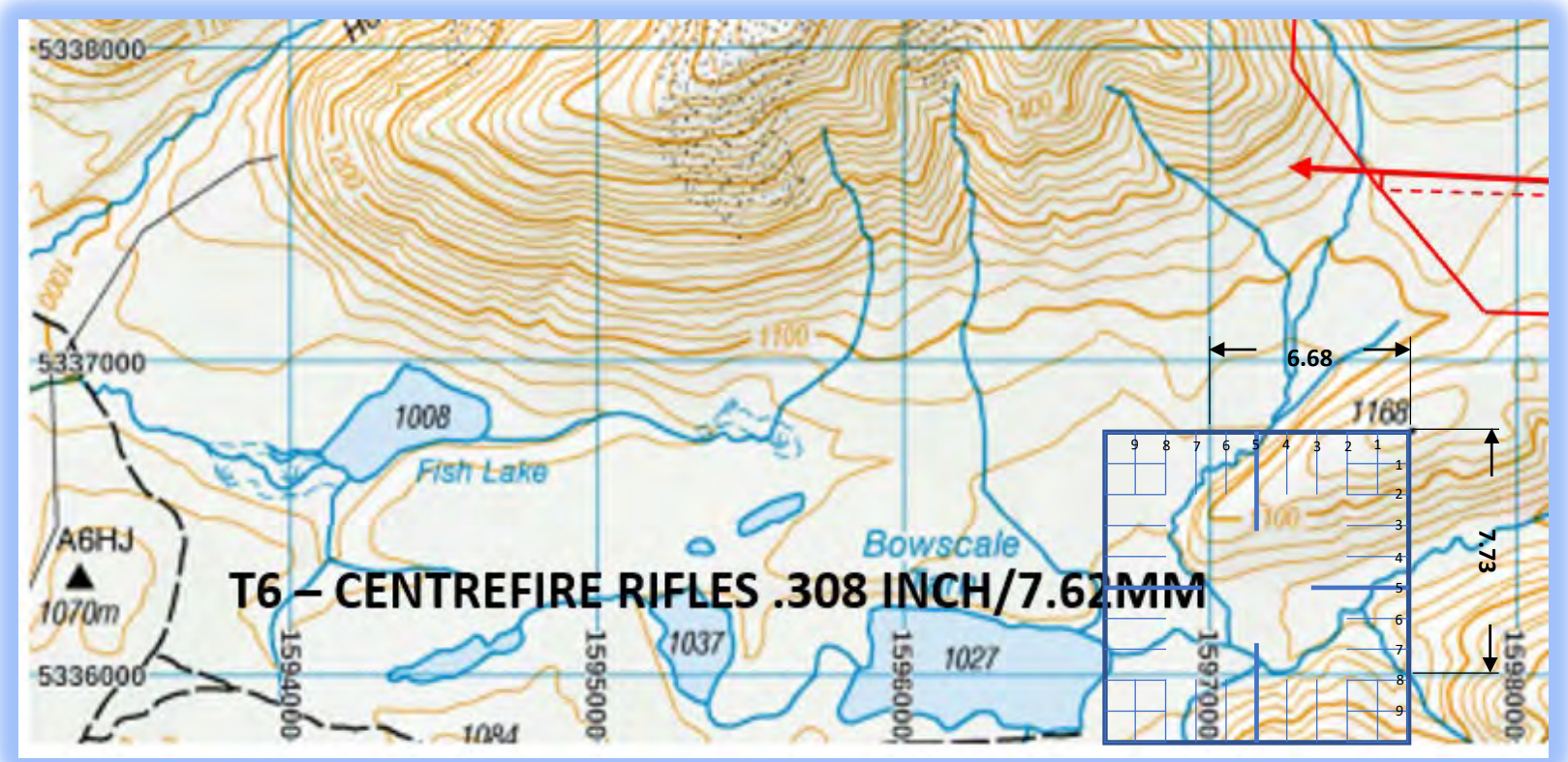
Correct use of the romer

Now the top right corner of the romer needs to be accurately located

At: E1597668, N5336773

Using the map legend we can see where the square E **1597**668, N **5336**773

Next is to move it accurately to E 1597**66**8, N 5336**77**3



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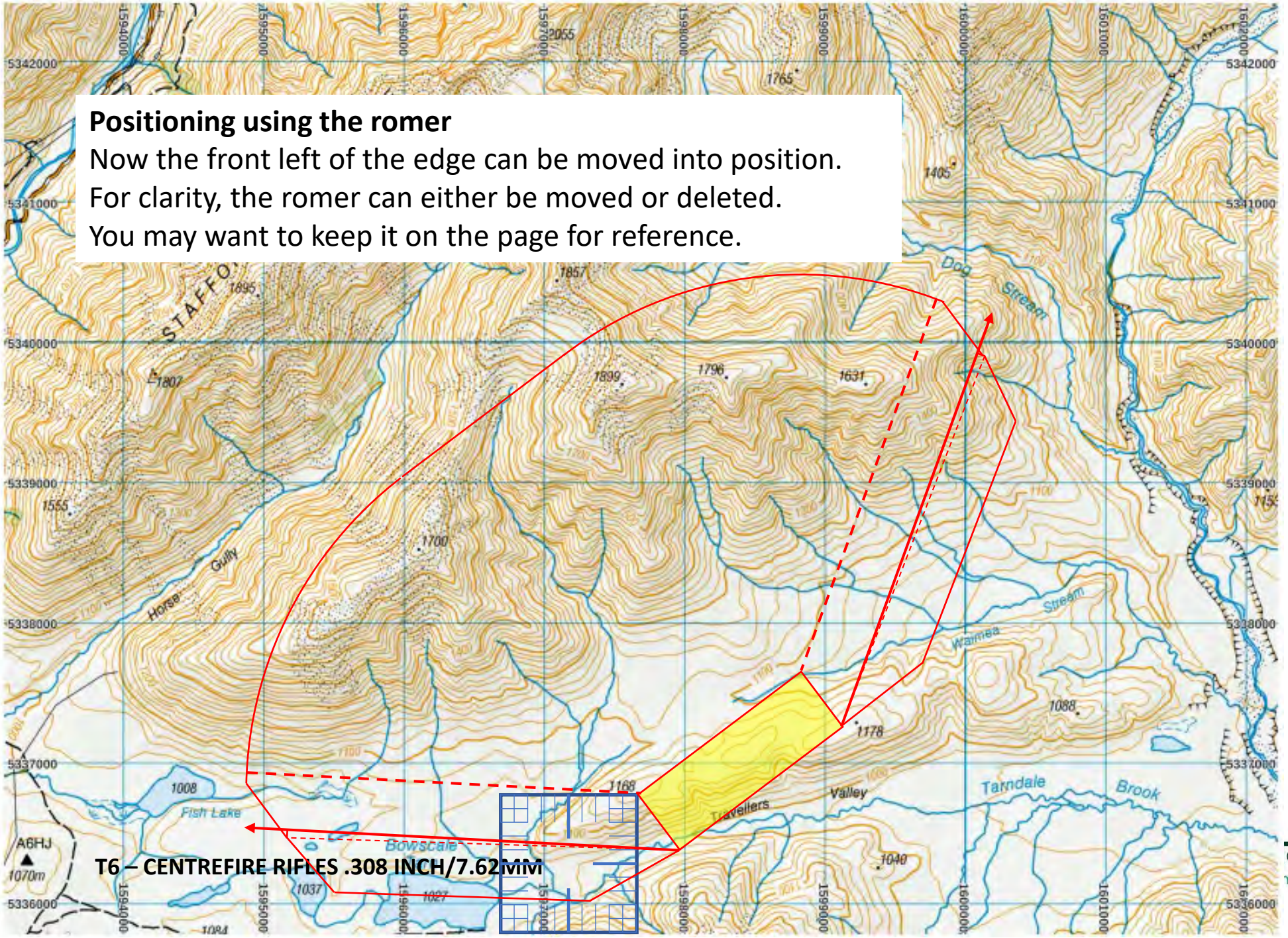
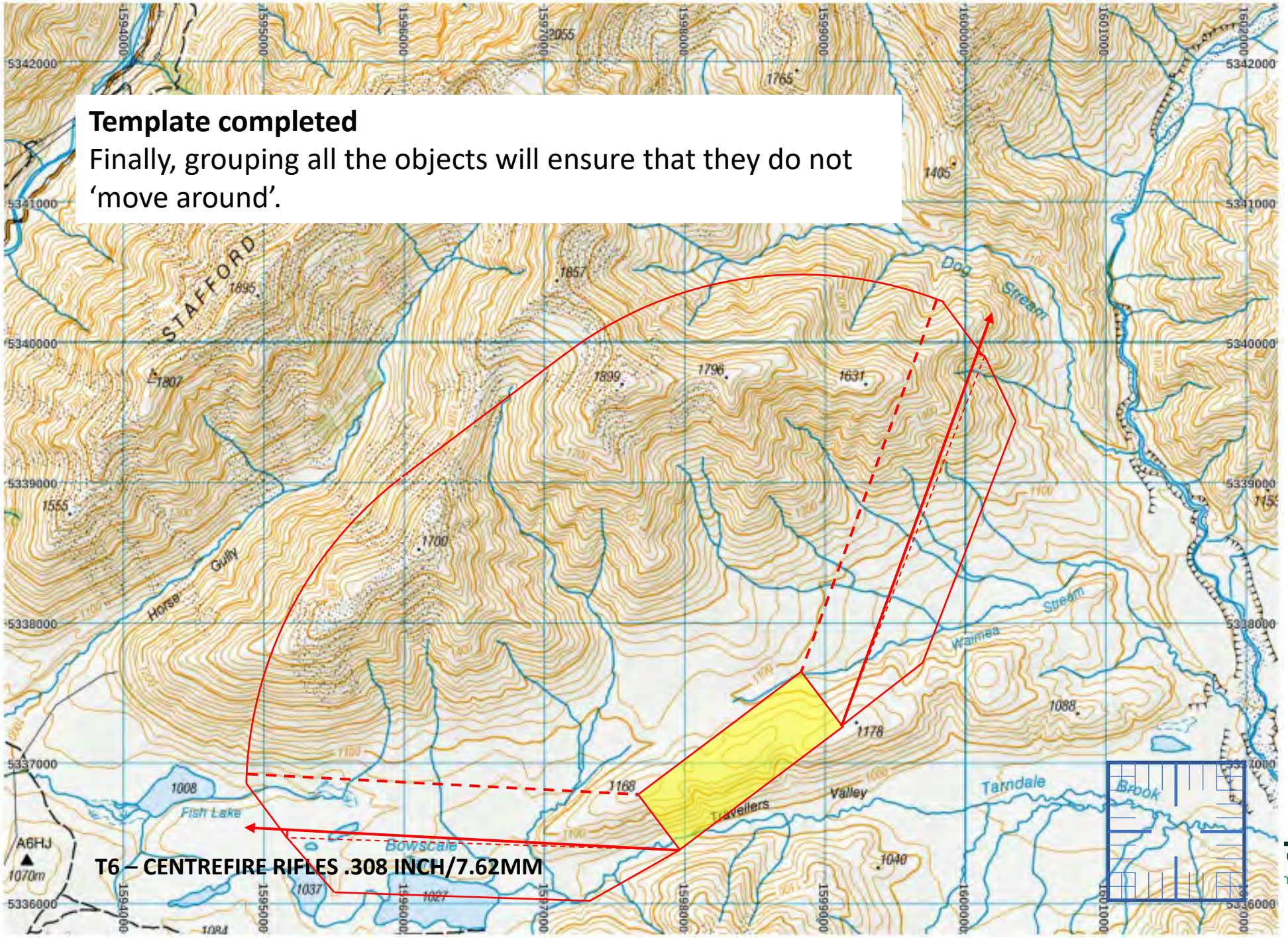

Positioning using the romer
Now the front left of the edge can be moved into position.
For clarity, the romer can either be moved or deleted.
You may want to keep it on the page for reference.
T6 – CENTREFIRE RIFLES .308 INCH/7.62MM
STAFFO
Dog Stream
Horse Gully
Waimea Stream
Tarndale Brook
Travellers Valley
Fish Lake
Bowscale
A6HJ
1070m



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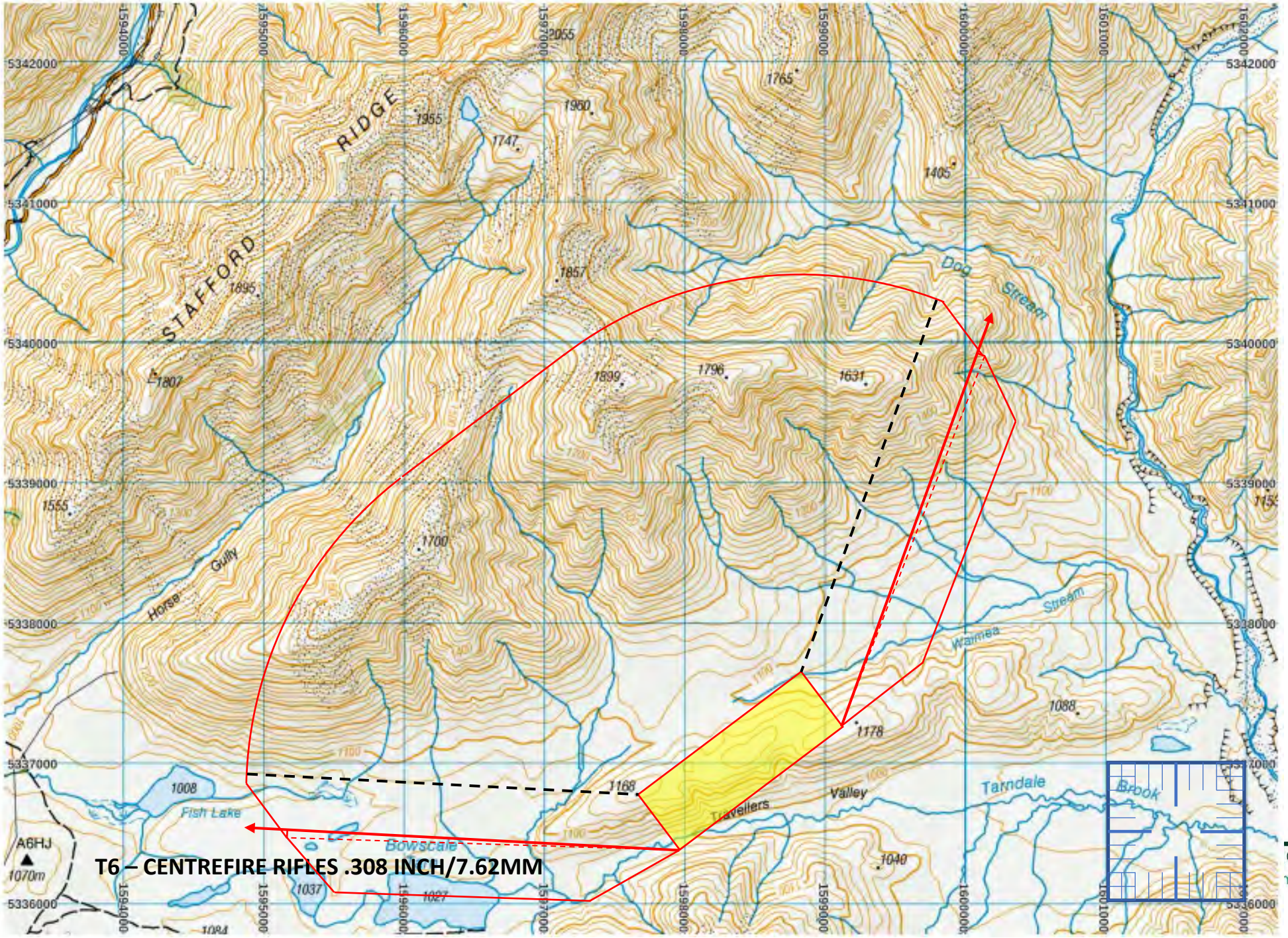

STAFFORD RIDGE
Dog Stream
Horse Gully
Waimea Stream
Travellers Valley
Tarndale Brook
Fish Lake
Bowscale
A6HJ
1070m
T6 – CENTREFIRE RIFLES .308 INCH/7.62MM

Example Annex for inclusion in RSOs

Once the scale diagram for the range danger area is checked for accuracy and complete. The SRO should paste it into the a word document for inclusion in RSOs.

It will be necessary to include the relevant range details in order for the SRI to check for accuracy during their review of RSOs as part of their Shooting Range Inspection reporting procedure.

The Clubs and Ranges Team will also be checking the range details for accuracy as part of review process for an Application for Range Certification.

EXAMPLE RANGE - RANGE STANDING ORDERS

ANNEX B: Range Danger Area

Range Name: - Example Range

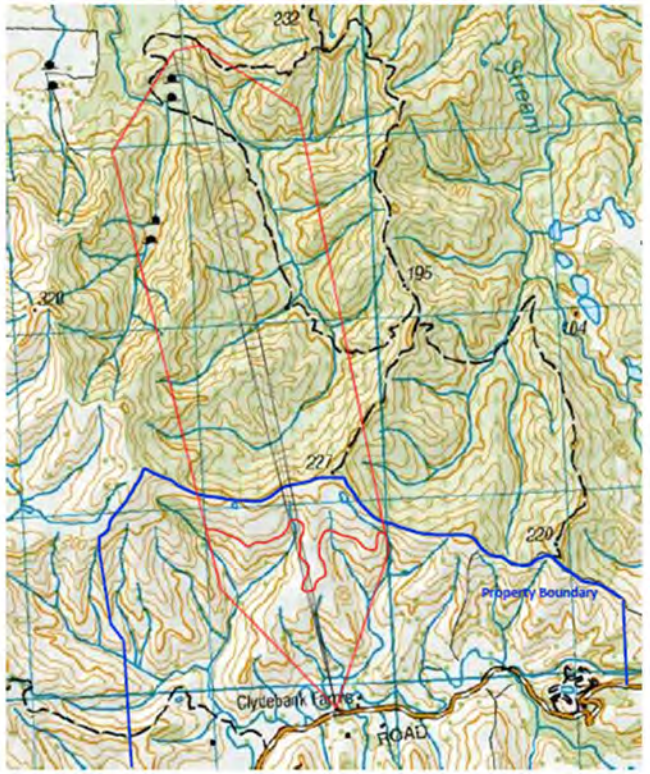
Map Reference: - NZTM Map Sheet AB1234 - 1:50,000

ADAT: - T7 Centrefire

FP (200m): - E1989666 N567889

Range Axis: - 349°

RDA: - Defined at the 140m contour line (red border)



EXAMPLE ONLY - Not the range in the presentation

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If you have any questions contact:
ClubsandRanges@police.govt.nz

Thank you.