

### Drilling Holes *Refer to Diagram 1 below*

- ▶ The hole diameter must be greater than or equal to the thickness of the glass with a minimum of 5mm.
- ▶ The distance from the edge of the hole to edge of the glass must be greater than or equal to 2 times the glass thickness. For glass 4 to 6mm thick, this hole distance can be reduced to 1.5 times the glass thickness.
- ▶ In a 90° corner the hole must be at least 4 times the glass thickness from one edge and at least 2 times the glass thickness from the other edge.
- ▶ In a corner that is over 90° the hole must be greater than or equal to 4 times the glass thickness from the corner and greater than or equal to 2 times the glass thickness from the other edges.
- ▶ In a corner that is less than 90° the hole must be greater than or equal to 4 times the glass thickness from the edge of the hole to the side edges and corner.
- ▶ The distance between holes must be greater than or equal to 4 times the glass thickness.
- ▶ Large hole diameters must be less than or equal to 1/3 of the pane width and height.
- ▶ In any pane with holes, the minimum width or height of the pane must be 8 times the glass thickness.

### Bevelling

- ▶ Bevelled glass can be toughened but there must be a residual edge on the glass of not less than 4mm.

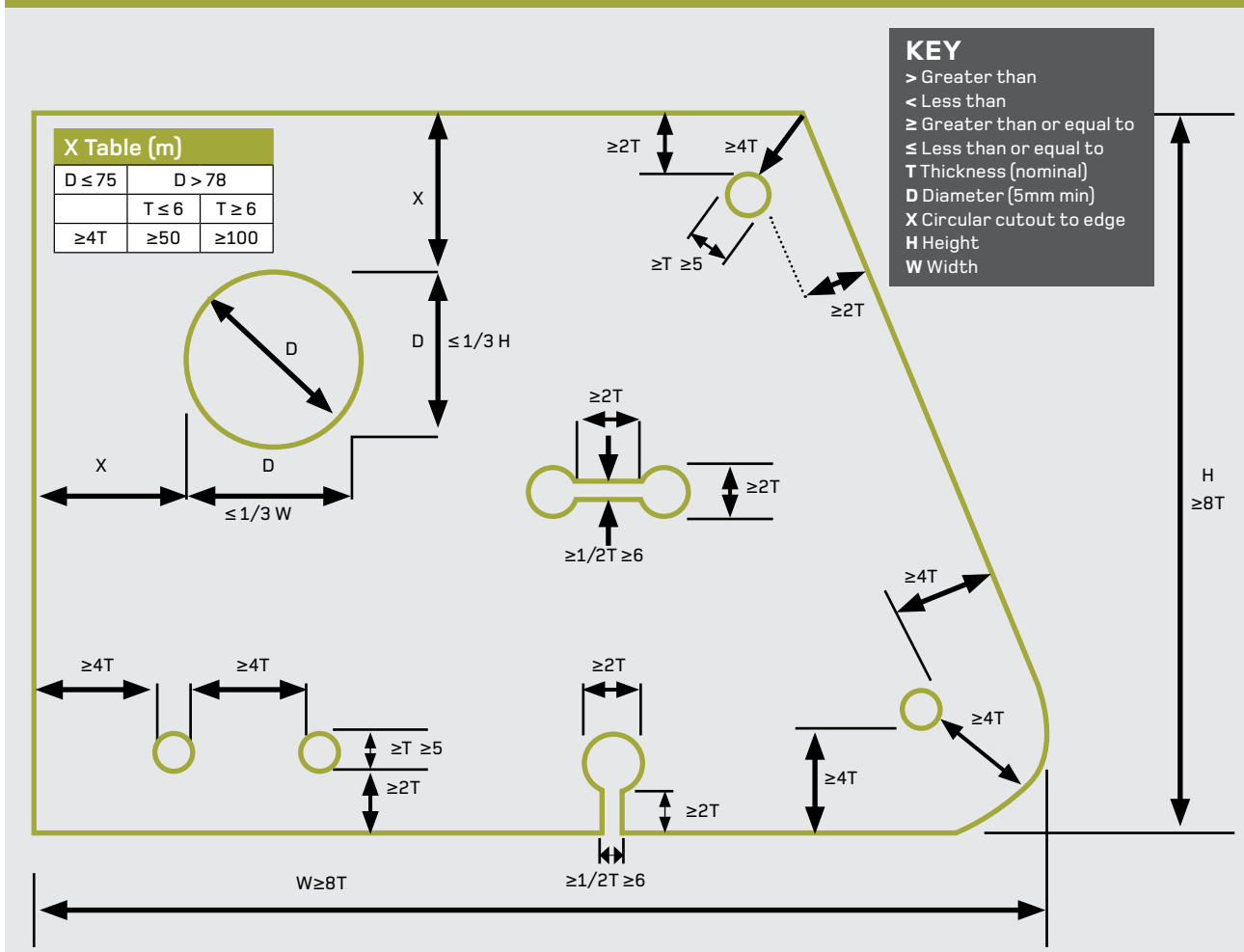
### Edgework and Processing

- ▶ All processing must be done before the glass is toughened. Any work attempted on toughened glass can cause shattering.

### Edgework on Holes, Cutouts and Notches

- ▶ Holes will generally have a ground finish with a small arrissed edge.
- ▶ Countersunk holes are available in glass of 6 - 19mm thickness and are countersunk to 45°. The countersunk face will also be a ground finish.
- ▶ Cutouts and notches will normally have an arrissed finish to the edges.
- ▶ Cutouts and notches can have flat grind or flat polish edges but some limitations apply to the dimensions due to tooling required, normally R 15 to 20mm.

Processing Limitations – Holes *Diagram 1*

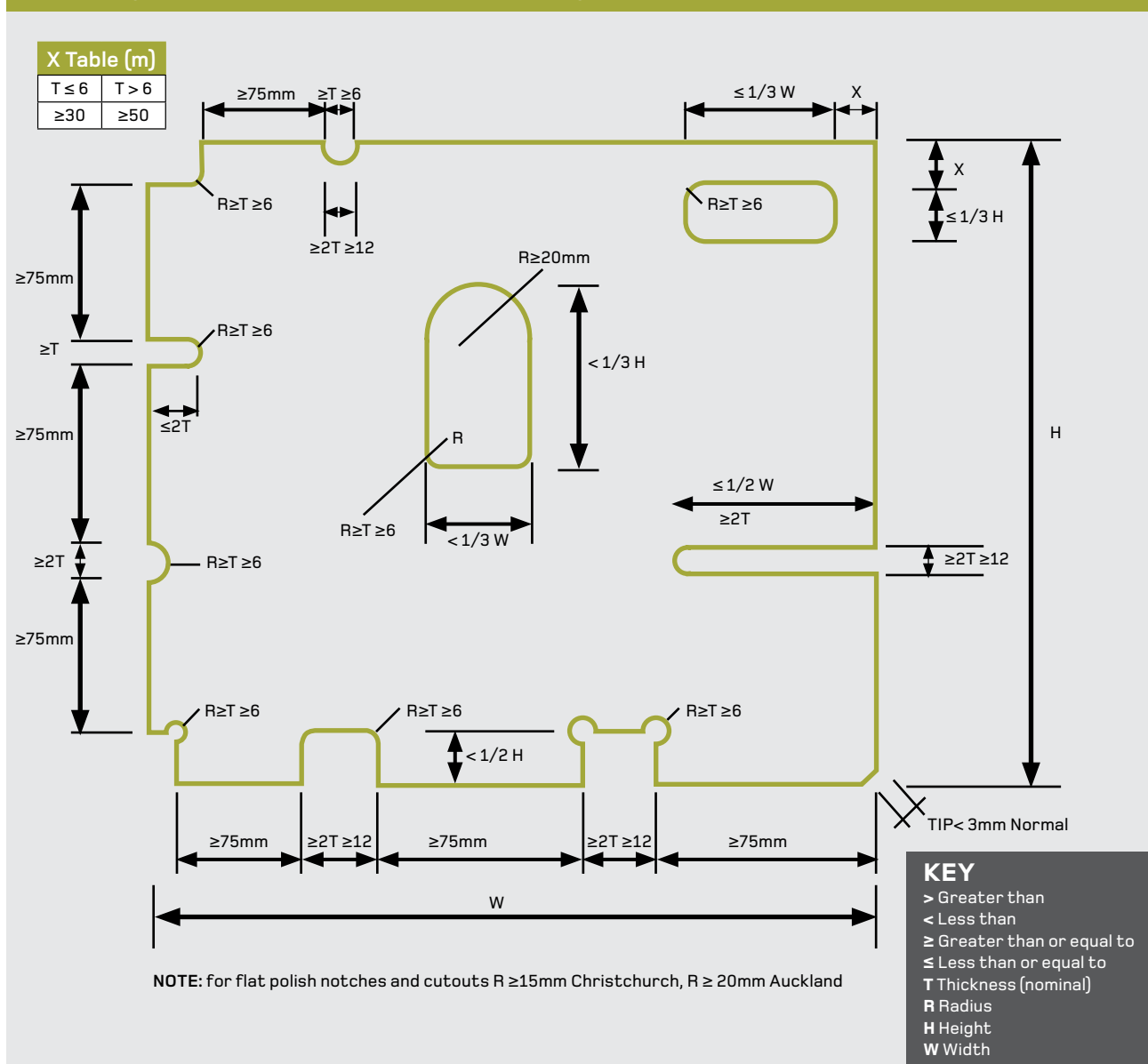


### Cutouts and Notches *Refer to Diagram 2 below*

- ▶ The distance between a notch and the glass edge must be greater than or equal to 75mm.
- ▶ The height or width of a cutout must not be less than or equal to 1/3 of the pane height or width.
- ▶ The distance of the cutout to the glass edge must not be less than 30mm for glass up to 6mm, and 50mm for glass over 6mm.
- ▶ All rectangular cutouts must have radius corners with a minimum radius either greater than or equal to the glass thickness.
- ▶ All cutouts with semicircular ends must have a 20mm minimum radius and internal corners with a minimum radius greater than or equal to the glass thickness.

- ▶ All notches must have holes or radii corners greater than or equal to the glass thickness, and no less than 6mm.
- ▶ Half hole 'C' notches must have a radius greater than or equal to the glass thickness and a slot opening greater than or equal to the glass thickness.
- ▶ Radius end slots greater than 2 times the glass thickness must be greater than or equal to 2 times the glass thickness wide.
- ▶ Corners are normally tipped to remove sharp corners and this flat ground edge varies with thickness, normally up to 3mm. Large tipped corners are known as corner cut offs and may require additional edgework, such as polishing to match the edge.

### Processing Limitations – Cutouts and Notches *Diagram 2*



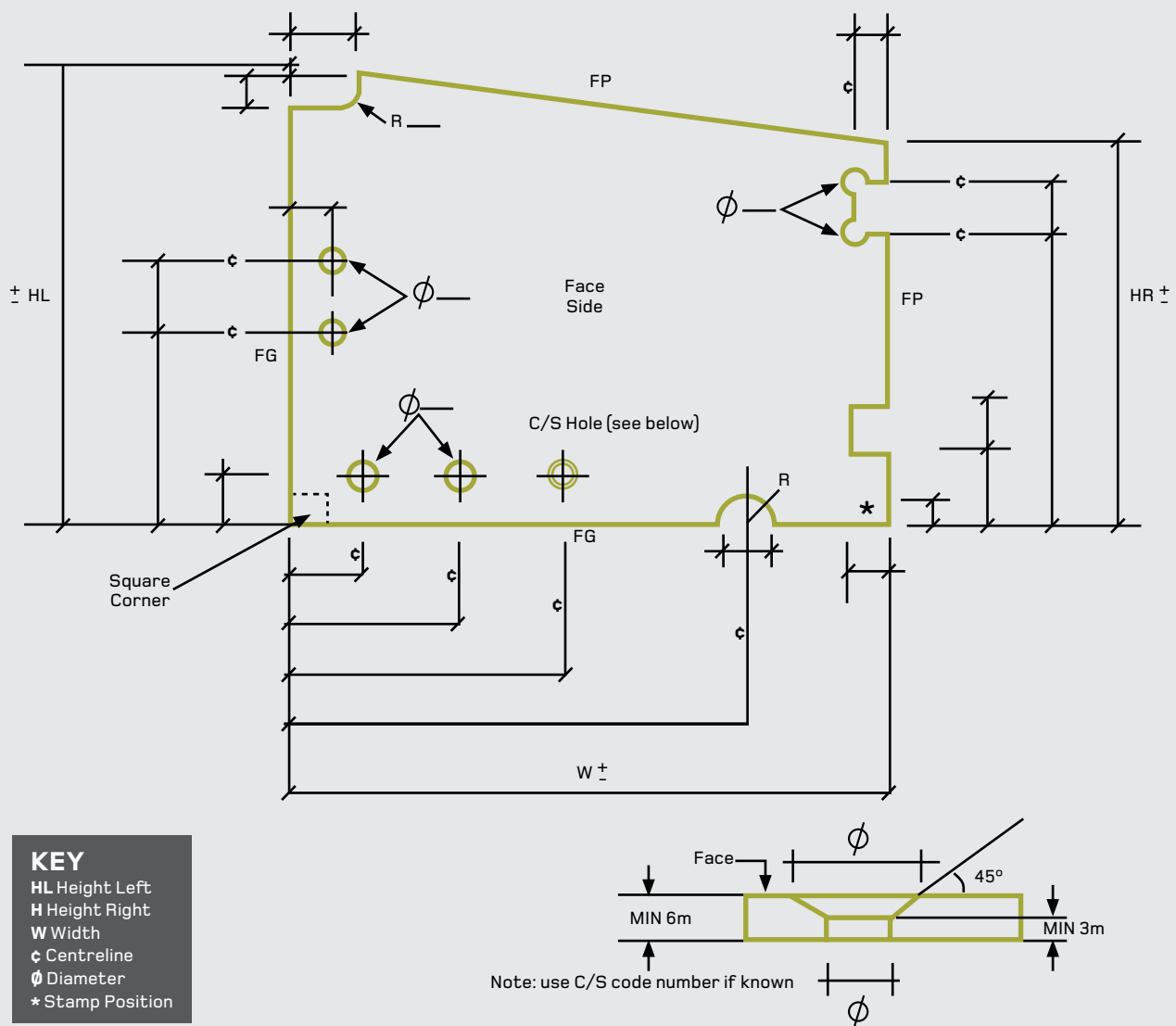
## Order Drawings

Refer to *Diagram 3* below for how to order glass requiring drawings and diagrams.

In order to avoid confusion, manufacturing delays or costly replacements, glass drawings and diagrams should meet the following guidelines:

- ▶ Dimension outside the pane where possible.
- ▶ Size holes inside the pane.
- ▶ Use codes or diagrams for countersunk holes.
- ▶ Dimension from a square corner and mark on drawing.
- ▶ Dimension from one edge to avoid accumulative error.
- ▶ Dimension to centre lines of holes or circular cutouts.
- ▶ Dimension to edges of square cut outs.
- ▶ Dimension between holes for handles.
- ▶ Mark edgework type on the outer edges.
- ▶ Mark the face side on the drawing.
- ▶ Dimension to actual cut size corner if panes are raking.
- ▶ Mark on the stamp location with dimensions if critical.

Order Drawing *Diagram 3*



## Edge Working

- Modern glass processing machinery provides a wide variety of edgework options. Maximum sizes vary depending on the machinery.

### Typical Edgework Terminology

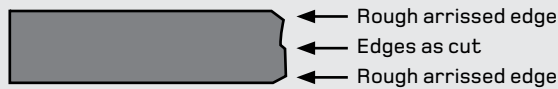
#### Clear Cut (CC)



15 and 19mm CC edges may require processing

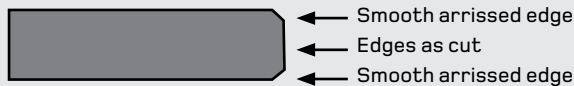
Edges are as cut. They may be uneven or have small shells.  
Edges are sharp.

#### Rough Arris (RA)



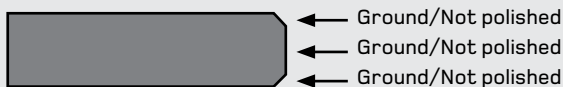
This edge is produced by a rough stone, belt or split arris diamond wheel. The edge of the glass is left with a white arris edge. This is the minimum edge required for toughened glass.

#### Smooth Arris



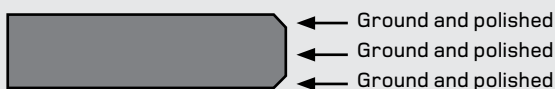
This edge is produced on a straightline edging machine with only the arrising wheels working or by a wet stone or belt process producing a smooth ground arris.

#### Flat Grind (FG)



This edge is produced on a straightline edging machine with the polishing wheels retracted. It leaves a diamond smooth unpolished finish. Normal finish for silicone butt glazing.

#### Flat Polish (FP)



This is the standard edge produced by a straight line edging machine and produces a fine polished flat edge suitable for situations where the glass has exposed edges as in furniture glass and all frameless toughened applications.