Radianz® Crack Prevention Case Study

Recommendations for cutting Radianz® Quartz to minimize crack during fabrication:

Tool

1. Blade: Use required engineered stone blade for cutting.
2. Blade: Keep the blade sharp and flat. Dress the new blade by running through sandstone off cuts.
3. Bridge saw: Keep the Saw blade direction parallel with saw moving direction
4. Bridge saw: Calibrate the bridge saw without huge vibration when it moving.
5. Using portable circular saw has high chance of causing crack during cutting.
   Cut-outs should be cut with bridge saw.
6. Saw bed: Working table should be flat. Solid bed is recommended.
7. Enough water should be used at all time during cutting.

Cutting

1. Do not plunge cut. Always start from the outside.
2. Do not stop in the middle of cutting process.
3. For cut-out or L & U shape top, drill the hole (relief hole) at the finish point the blade stop.
   Start cut from outside toward relief hole.
4. Smaller size of slab cracks less, trim the slab smallest before cutting the L & U shape.
5. Cut the shortest cuts first .
6. Recommended cutting speed for straight cut is as follow: THK.20 : 3m/min, THK.30 : 2m/min.
   If the design is L or U shape, the cutting speed should be decreased.
7. There should be no bevel edge cracking.
8. Enough water should be used at all time during cutting.

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FABRICATION 1 : Straight Cut

- **Revolution of saw**

Diameter	300mm(12”)	350mm(14”)	400mm(16”)
Revolution	≒1,780rpm	≒1,540rpm	≒1,340rpm

* The revolutions of the cutting blade can be different according to the specifications of Bridge machine and saw.

- **Cutting speed**

  < 3.0m/min (Thickness : 20mm)

  < 2.0m/min (Thickness : 30mm)

- **Cutting saw**

  - Required engineered stone blade should be used.
  - Granite cutting saw : Unacceptable (Risk of crack)
  - Marble cutting saw : Partially allowed but consumption of the blade can be high.

Rail saw

Bridge machine

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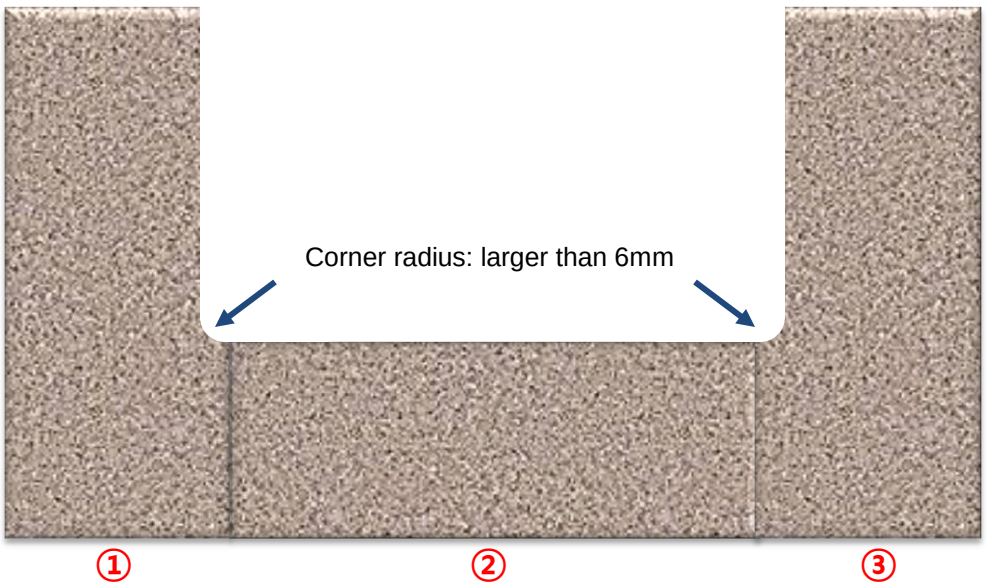
FABRICATION 2 : L-shape & U-shape design

- **Crack Solution**

  - Make the L & U-Shape with 2 & 3 pieces.
  - round the corner larger than 6mm radius.



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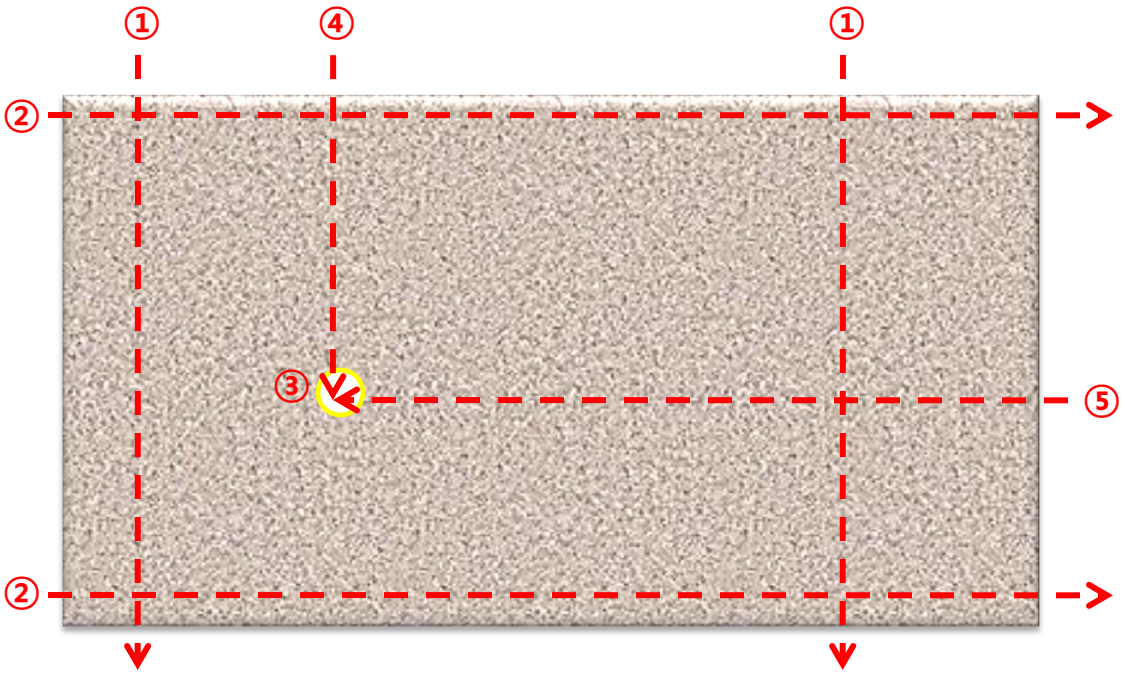
FABRICATION 3 : L-shape

- **Fabrication Sequence**

  - Step 1, 2: Trim the slab. Make smallest size.
  - Step 3 : Drill the hole.
  - Step 4, 5: Cut the L-shape from out side toward the relief hole.

  * Cut the shortest first, start from outside



- **Crack Solution**

  - Slow down the speed for step 4 and step 5. (speed recommendation: < 1m/min)

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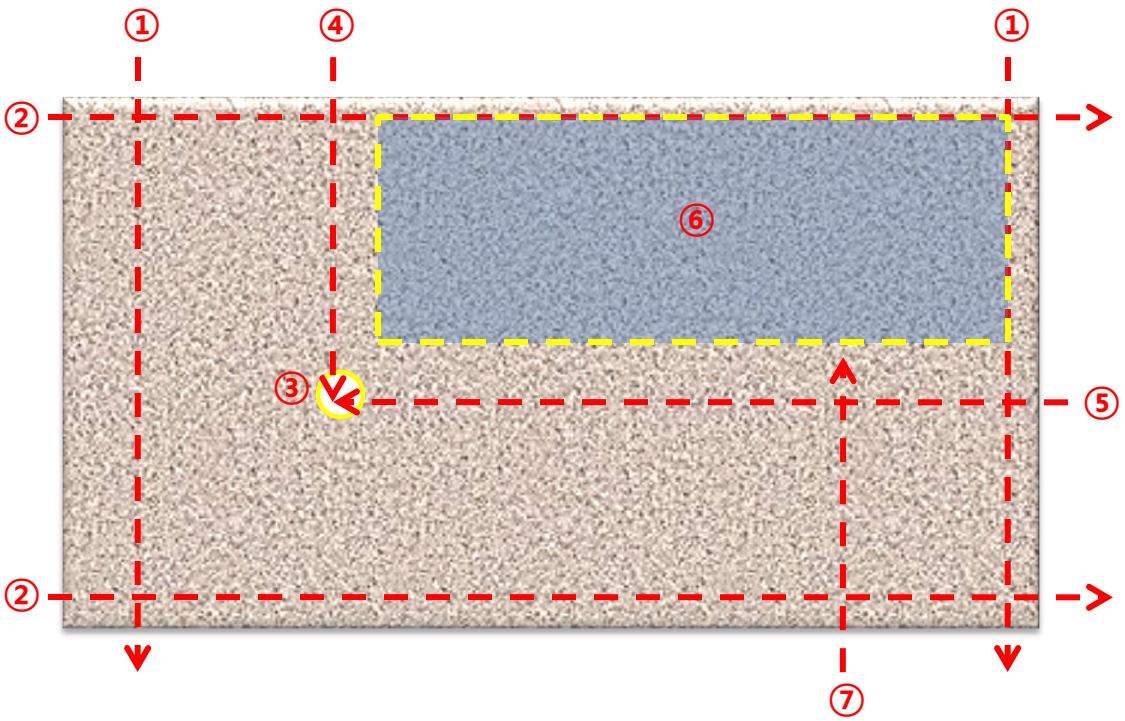
FABRICATION 4 : L-shape + more piece (ect. Island)

- **Fabrication Sequence**

  - Step 1, 2: Trim the slab. Make smallest size.
  - Step 3 : Drill the hole.
  - Step 4, 5: Cut the L-shape from out side toward the relief hole.
  - Step 6 : Separate Island piece from L-shape piece.
  - Step 7 : Trim the L-shape size

  * Cut the shortest first, start from outside



- **Crack Solution**

  - Slow down the speed for step 4 and step 5. (speed recommendation: < 1m/min)

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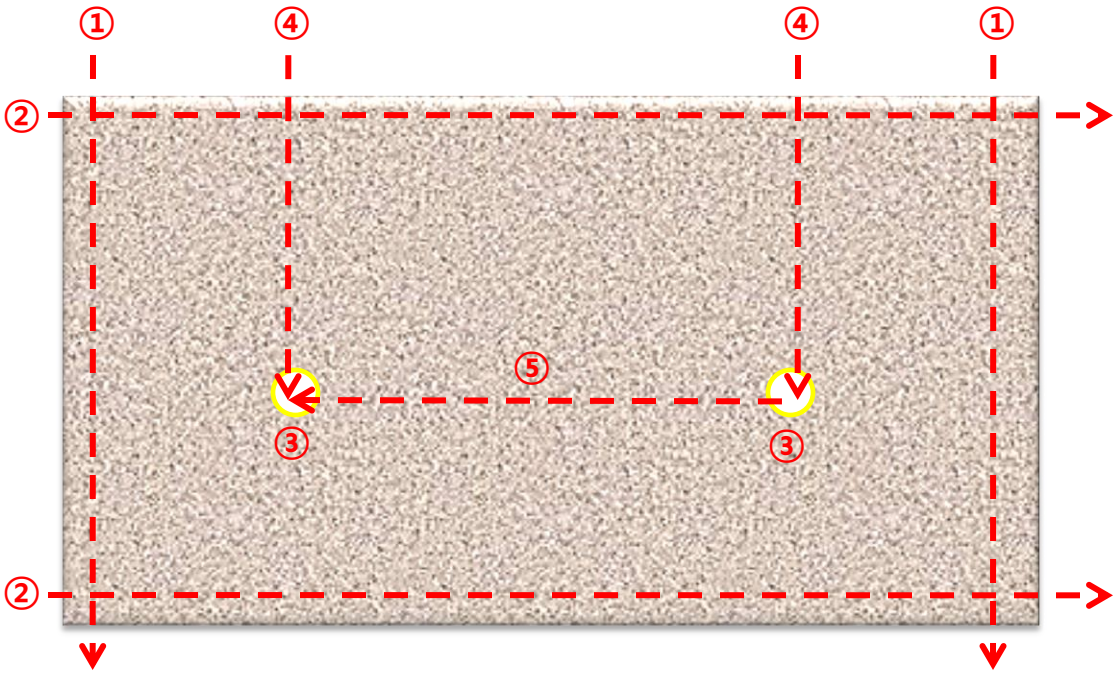
FABRICATION 5 : U-shape

- **Fabrication Sequence**

  - Step 1, 2: Trim the slab. Make smallest size.
  - Step 3 : Drill the hole.
  - Step 4, 5: Cut the U-shape from out side toward the relief hole.

  * Cut the shortest first, step 5 is the latest cut



- **Crack Solution**

  - Rather than design one piece of U-shape, separate into three piece
  - Slow down the speed for step 4 and step 5. (speed recommendation: < 1m/min)

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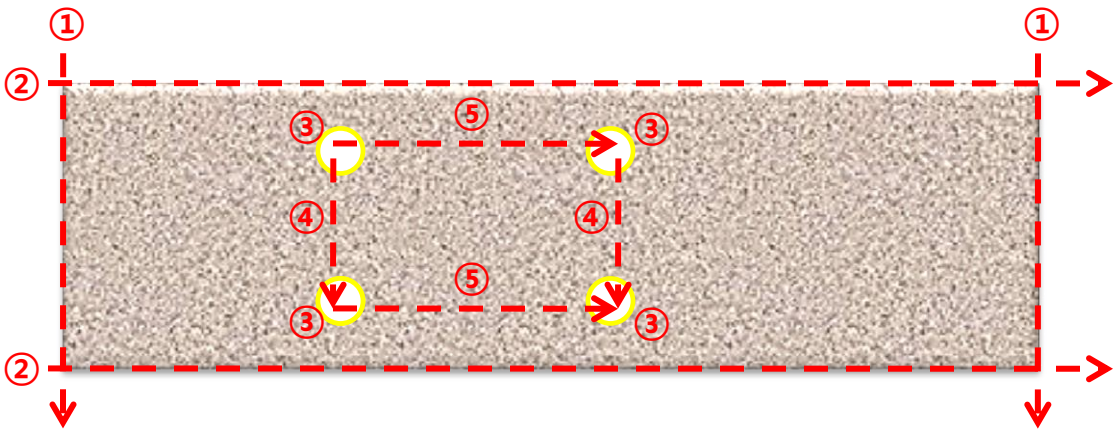
FABRICATION 6 : Cut-out

- **Fabrication Sequence**

  - Step 1, 2: Trim the slab. Make smallest size.
  - Step 3 : Drill the hole.
  - Step 4, 5: Strait cut (diamond disk grinder can be used with plenty of water)



- **Crack solution**

  - Bigger size top is more risky than smaller one. Before cut-out, trim first and make smallest size.
  - Slow down the cutting speed for a case of big island cut-out.

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FABRICATION 7 : Saw binding (Settling)

- **Cause**

  - Due to engineered stone is made of resin, material have inner tension.
  - This tension is different every slab by slab.
  - This may cause closing up when cutting process behind the blade.
  - This may eventually stop the cut and bind saw or may cause a crack.

- **Solution**

  - As the cutting length shorter, this saw binding will decrease.
  - Don’t cut the longest first, cut shortest first.
  - When the slab have the binding, slowdown the cutting speed than normal speed.
  - Use shim (wedge) behind the blade.

FABRICATION 8 : Water jet carck

- **Cause**

  - Water jet is a machine that cut with water pressure and easily turn the cutting direction.
  - The slab may have much stress when the water jet cut the corner.

- **Solution**

  - Making the relief hole on the corner will help to prevent a crack.
  - Reduce the cutting when cut the corner area.

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CRACK CASE 1-1 : Cut-out area (Sink, cook top etc.)

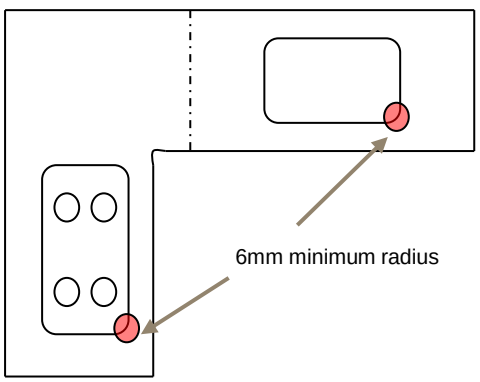
- **After fabrication or installation**

- **Cause**

  - Do not comply with fabrication manual.
  - Radius inside corners to a minimum of 6mm will reduce corner stresses.

- **Solution**

  - Any inside corner must have 6mm minimum radius.



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CRACK CASE 1-2 : Cut-out area (Sink, cook top etc.)

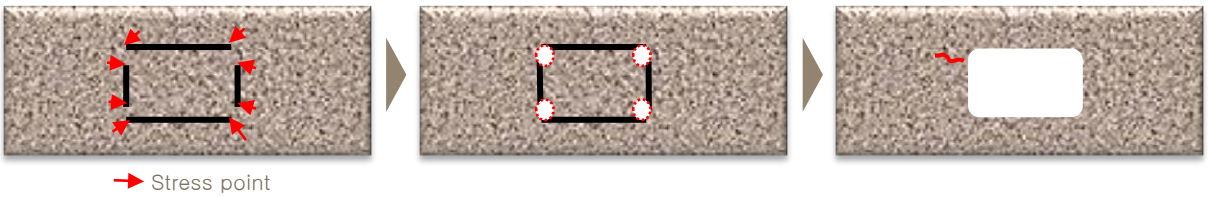
- **Cause**

  - Do not comply with fabrication manual.
  - Straight cut without corner drilling.

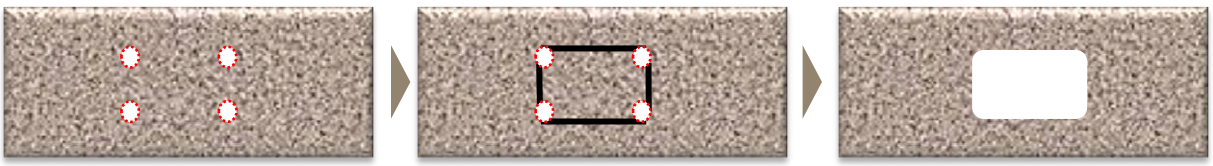
- **Solution**

  - Sink & Bowl cutout should be using the core bit to drill-press the four corner and use circular saw to cut between the holes.

■ Incorrect process



■ Correct process



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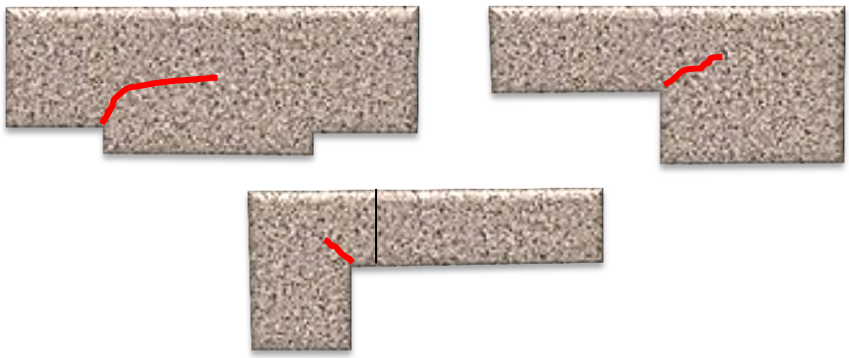
CRACK CASE 2 : Square inside corner

- **After fabrication or installation**

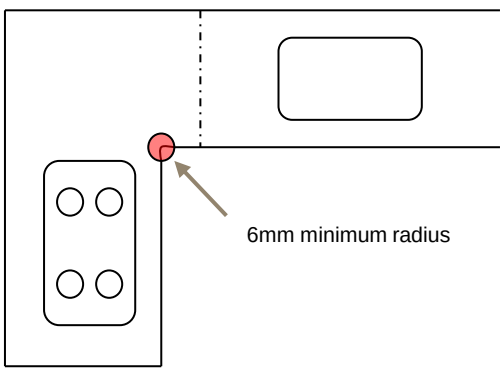


- **Cause**

  - Do not comply with fabrication manual.
  - Straight cut Without corner drilling.
  - Radius inside corners to a minimum of 6mm will reduce corner stresses.

- **Solution**

  - Any inside corner must have 6mm minimum radius.



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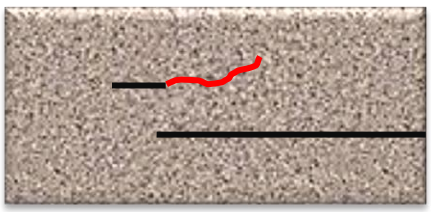
CRACK CASE 3 : Straight cut

- **During fabrication**



- **Cause**

  - Do not comply with fabrication manual.
  - No radius and Product should be cut from edge.

- **Solution**

  - Never stop saw in the middle of cutting process

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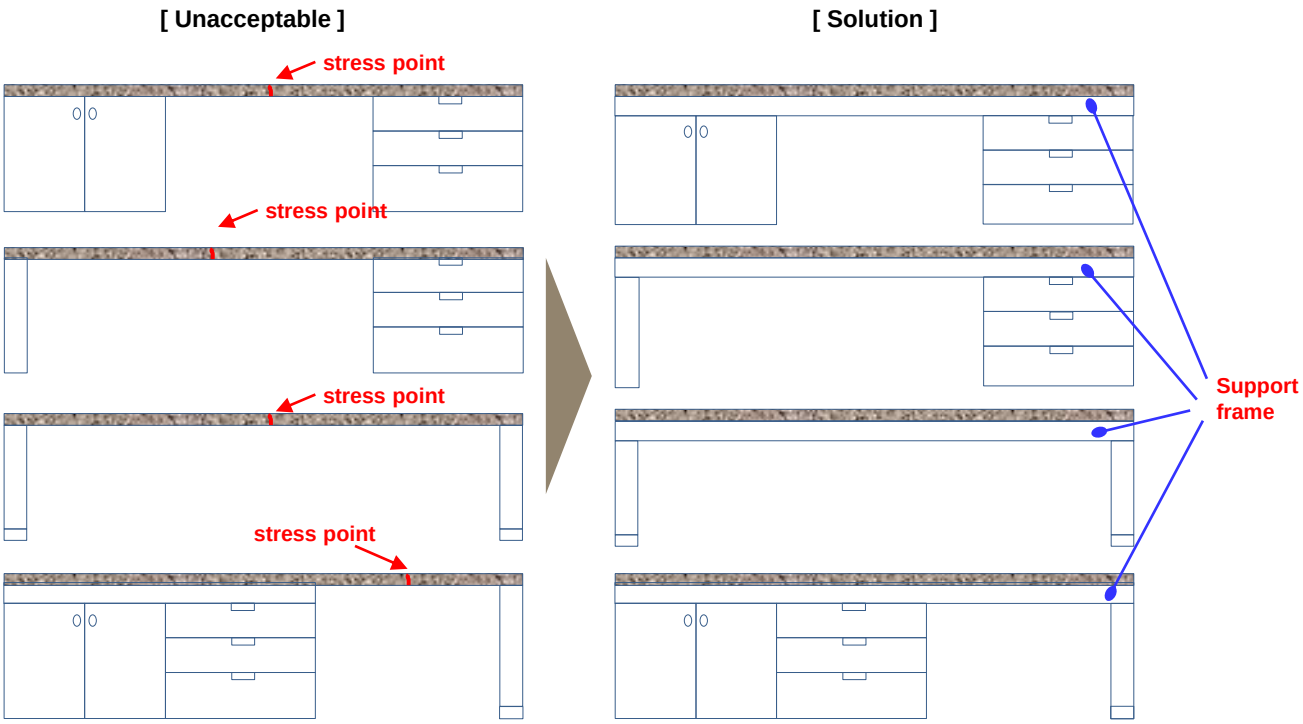
CRACK CASE 4 : Improper support frame



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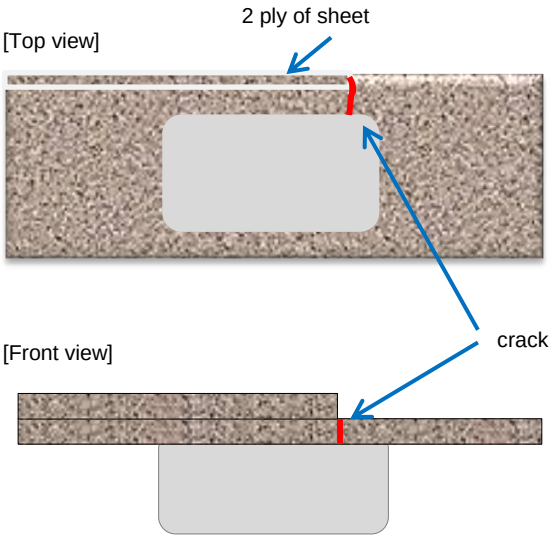
CRACK CASE 5 : Handling error

- **After fabrication**



- **Cause**

  - Handling error

- **Solution**

  - The area of stress point should be handled after the reinforcement.
  - Always carry the top on edge. Do not carry the top flat.

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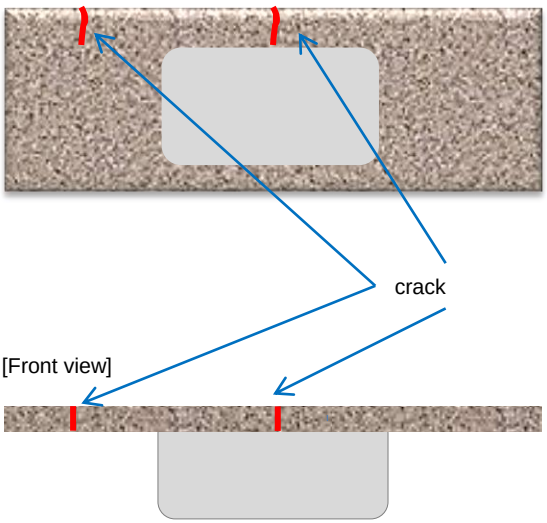
CRACK CASE 6 : Edge crack

- **After installation**

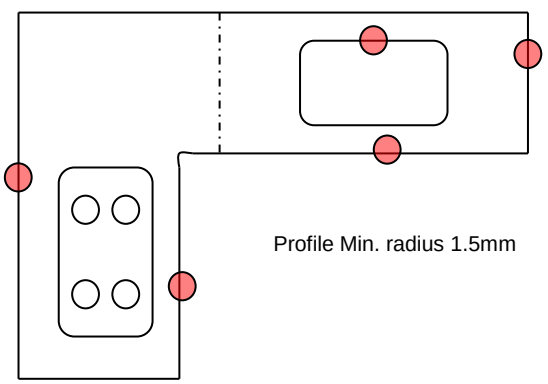


- **Cause**

  - Do not comply with fabrication manual.

- **Solution**

  - Radius all top and bottom straight edge profiles to a minimum of 1.5mm radius.



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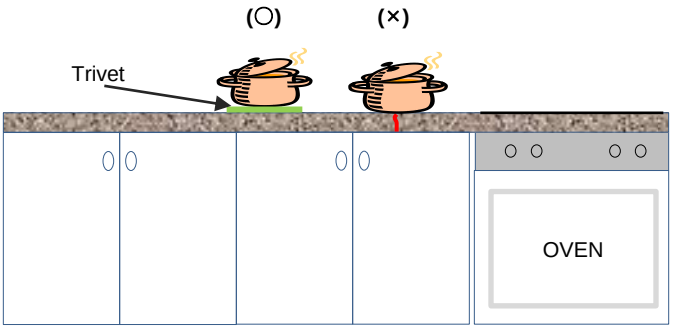
CRACK CASE 7 : Thermal shock (Cook top area)



- **Cause**

  - Hot pot placed directly on Top.

- **Solution**

  - Trivets or hot pads should always be used.

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CRACK CASE 8 : Brittleness by low temperature

- **During fabrication**

- **Cause**

  - Increased brittleness cause by low temperature.

- **Solution**

  - Decelerate the cutting speed 20%~30%.
  - If the stored at outside or low temperature, move the slab to building inside or warm place at least 24 hours at 15~20℃.

  * Reference

Working Temperature	Cutting speed	
	20mm THK.	30mm THK.
5℃ ~ 30℃	< 3.0 m/min	< 2.0 m/min