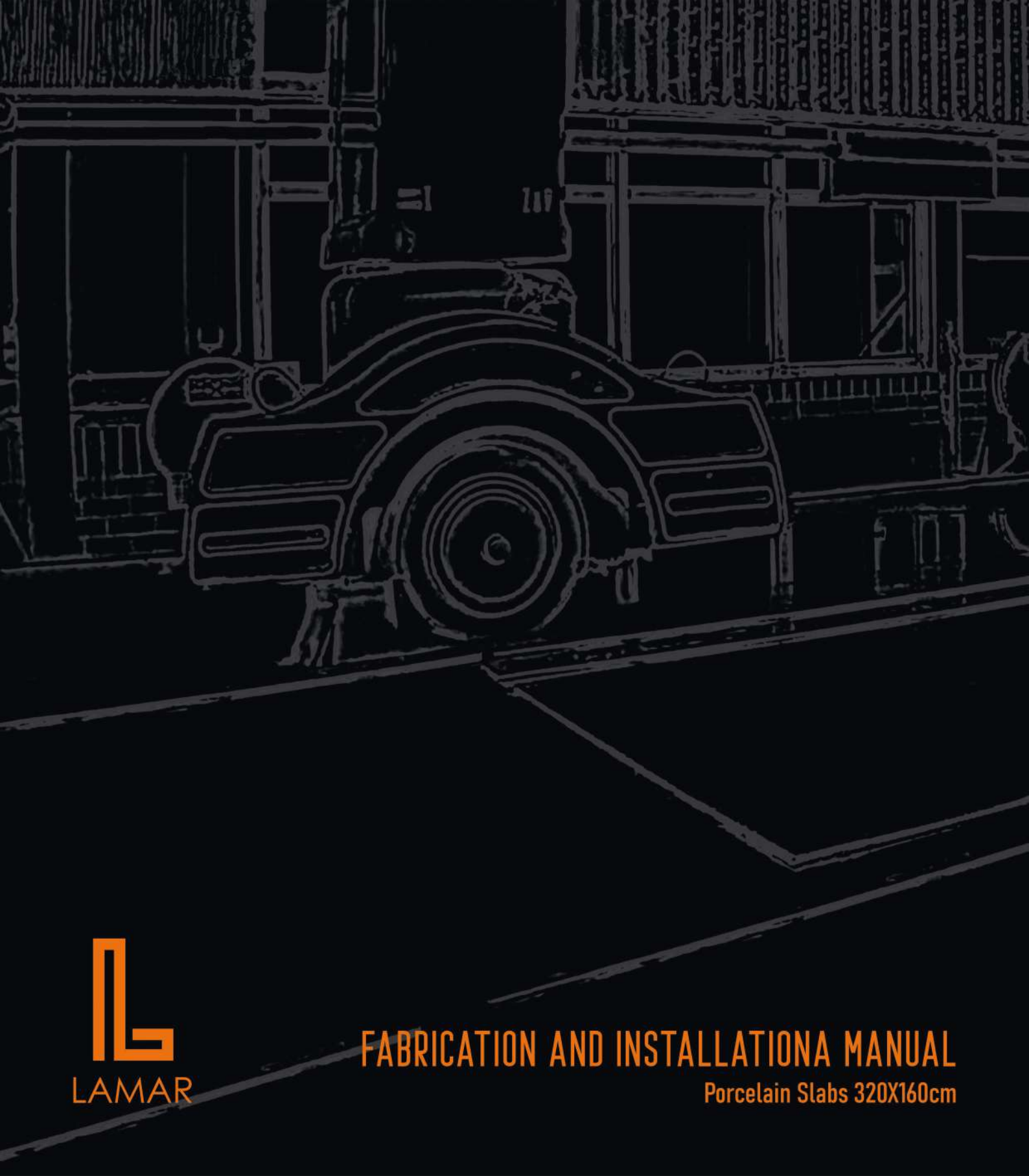




FABRICATION AND INSTALLATIONA MANUAL

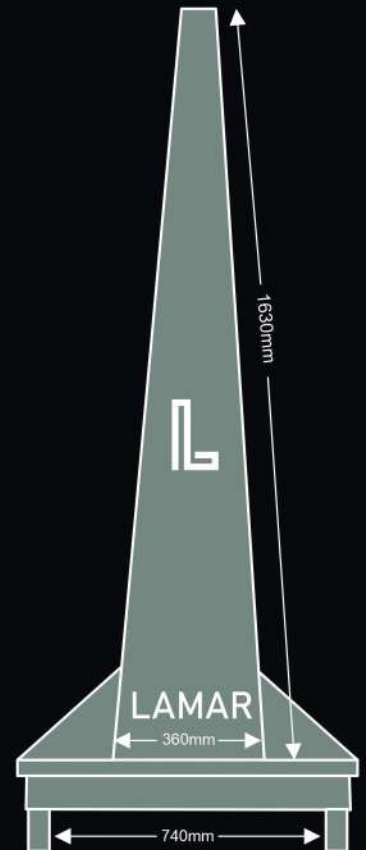
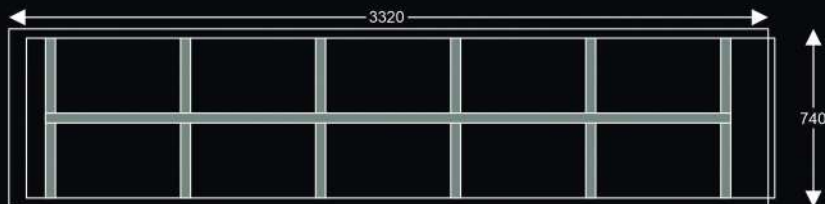
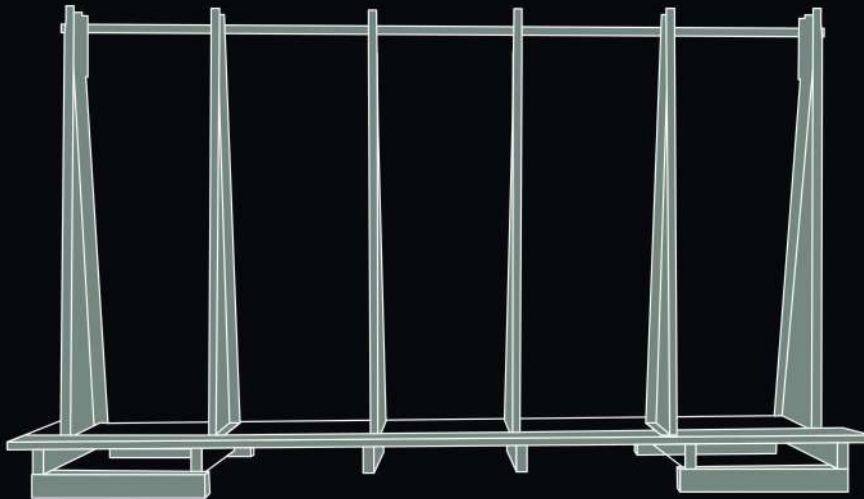
Porcelain Slabs 320X160cm

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1. PACKAGING AND ROAD TRANSPORTATION

- LAMAR Porcelain slabs are transported while packed upright on A-Frames as depicted below.
- The safe number of slabs on each side of the standard LAMAR A-Frame depends on the thickness of the slabs.
- During HGV transportation both the slabs and the A-frames must be safely secured using sufficiently strong ratchet straps.



2. HANDLING AND STORAGE WITHIN A FACTORY OR WAREHOUSE

2.1 EQUIPMENT REQUIRED

- Forklifts with forks at least 2.5 m long for loading/unloading metal pallets.
- Suction cups with frame for handling the slabs or Rubber coated canvas belts or double clamp with overhead crane.

2.2 PROCESS

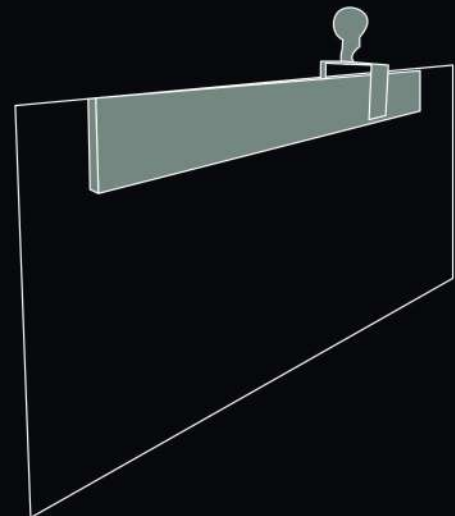
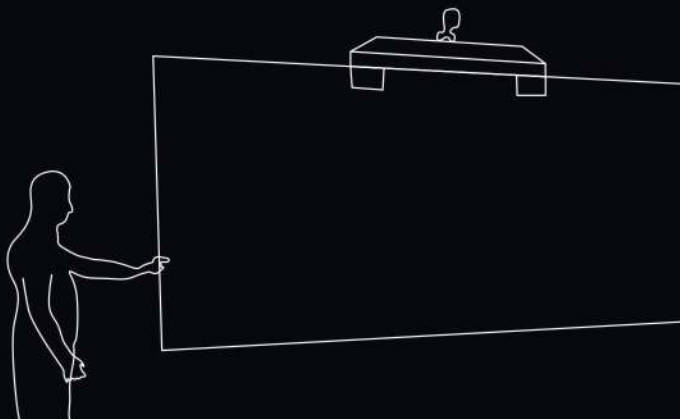
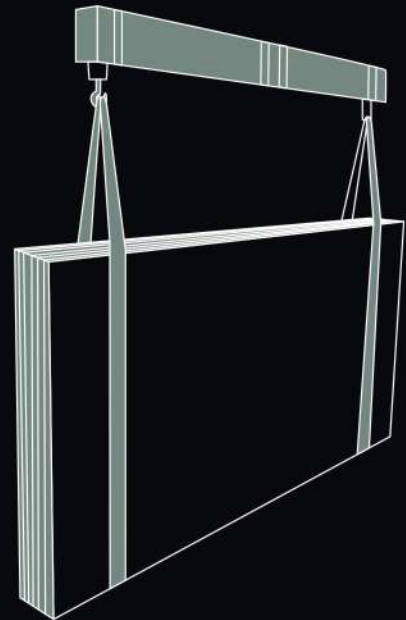
2.2.1 Transporting A-Frames

- When handling A-Frames, use a forklift or crane to lift and place the frames at the desired location.
- The forks must be inserted centrally into the base of the A-Frames at right-angles to the length of the slabs, with both forks fully inserted into the A-frame to maintain balance.
- Do make sure the frame is stable before moving the forklift. It is recommended to keep the frame safely close to the ground whilst moving the frame.



2.2.2 Transporting Slabs

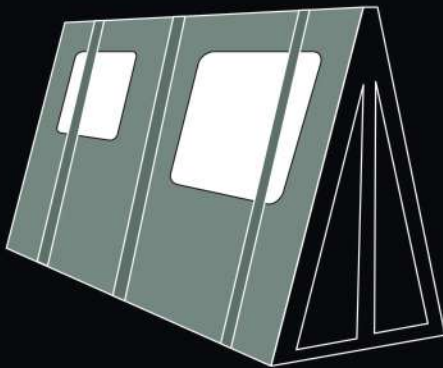
- Remove any packaging from the slab.
- The preferred means of transporting LAMAR slabs is by using a bridge crane and rubber coated canvas belts.
- Clamps (as depicted below) can also be used. In case a double clamp is not available, it is recommended to insert a 2 cm thick plank of at least 300 cm length between the slab and the clamp (on the back side of the slab) to support the slab while transporting.
- When using a clamp only move one slab at a time.
- Slabs must always be moved upright.
- All movement needs to be done with care and attention to avoid breakage/ splintering. Any sudden movements must be avoided.
- The weight of the slab must be distributed evenly across the point of the gripped load so they remain balanced during transportation.



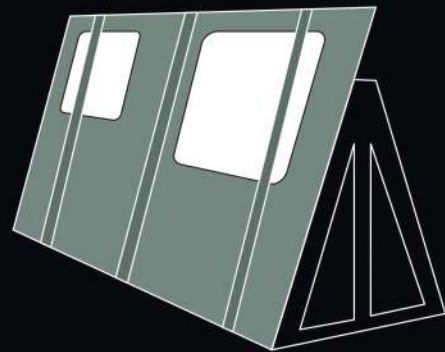
2.2.3 Storing Slabs

- Slabs must always be stored upright. The supports used must match the size of the slab and be strong enough to take the weight of the slabs. It is recommended that LAMAR slabs be protected with rubber padding on stands.
- Avoid stacking smaller cut pieces between larger ones.
- Do not stack slabs horizontally lying down.

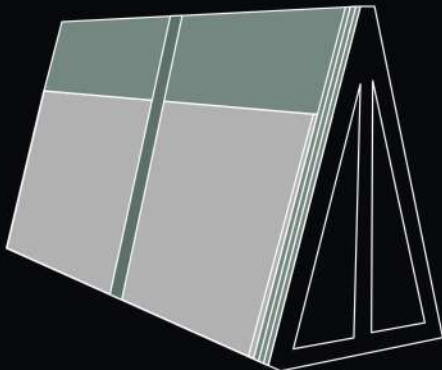
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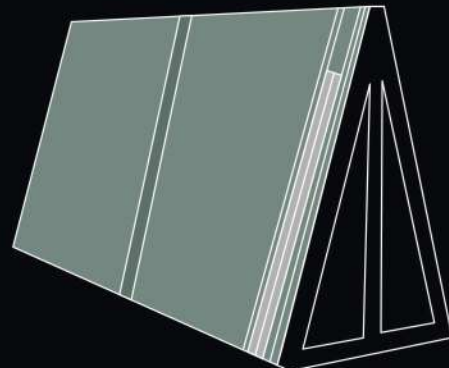
INCORRECT ✗



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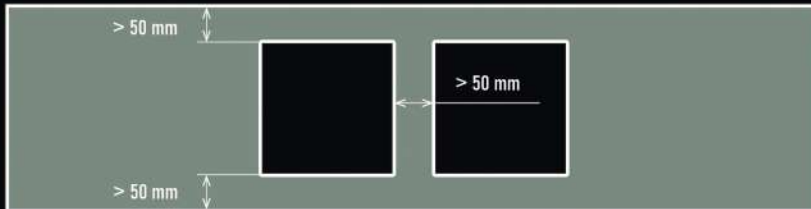
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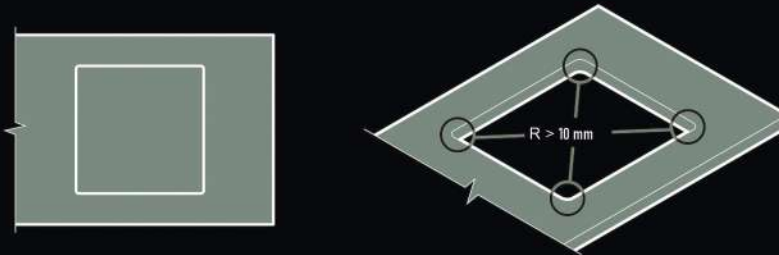
3. DESIGNING

3.1 INTERNAL CUT-OUTS AND MINIMUM DISTANCES

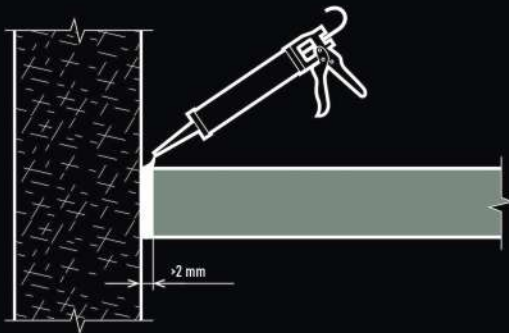
All internal openings must be at a distance of at least 5 cm from the edges of the slab and from each other.



The radius of the internal corners must be greater than 10 mm. Right angle internal corners must not be used as they can weaken the structural strength of the countertop, due to the right angles significantly increasing the risk of stress cracking.

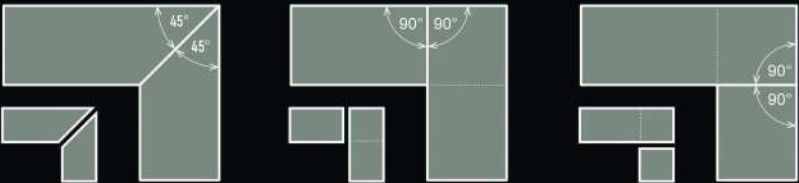


The minimum joint gap between the LAMAR slabs and any other adjoining surface (for example, walls, other LAMAR slabs, sink, hob etc) should be at least 2 mm. The 2 mm joint gap can be sealed with a colour matched silicone. The sealant that is used must be specified to withstand thermal variations if a hob, oven or barbecue is in the same vicinity.

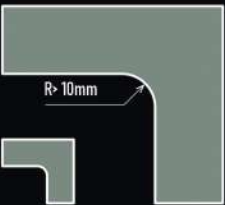


3.2 L-TOPS

It is recommended that two cut to size slabs are used when making L- shaped tops to avoid the risk of stress cracking from 90° internal angles within a single slab. An L shaped-top can be created in the following three ways, whichever is preferable based on the aesthetics required of the design and the direction of the decor of the specified slab.

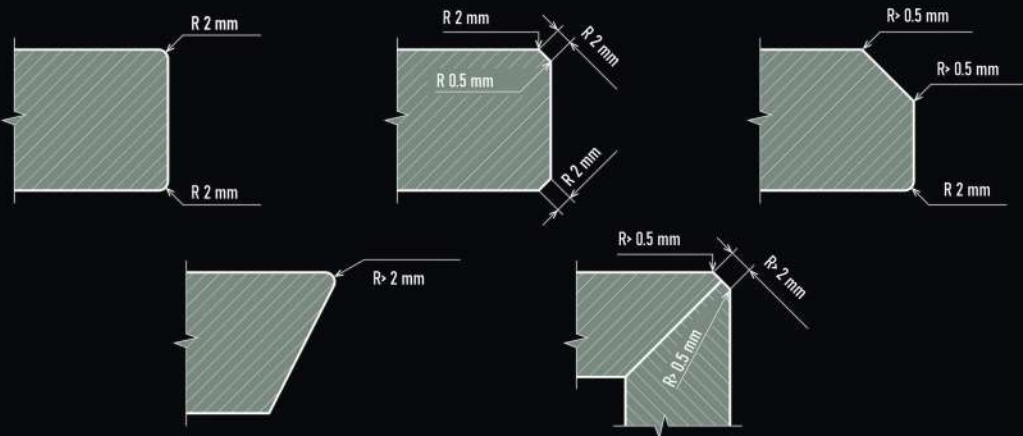


However, if you do choose to specify a single slab to create an L- shaped top, the bend radius must be at least 10 mm.



3.3 EDGES

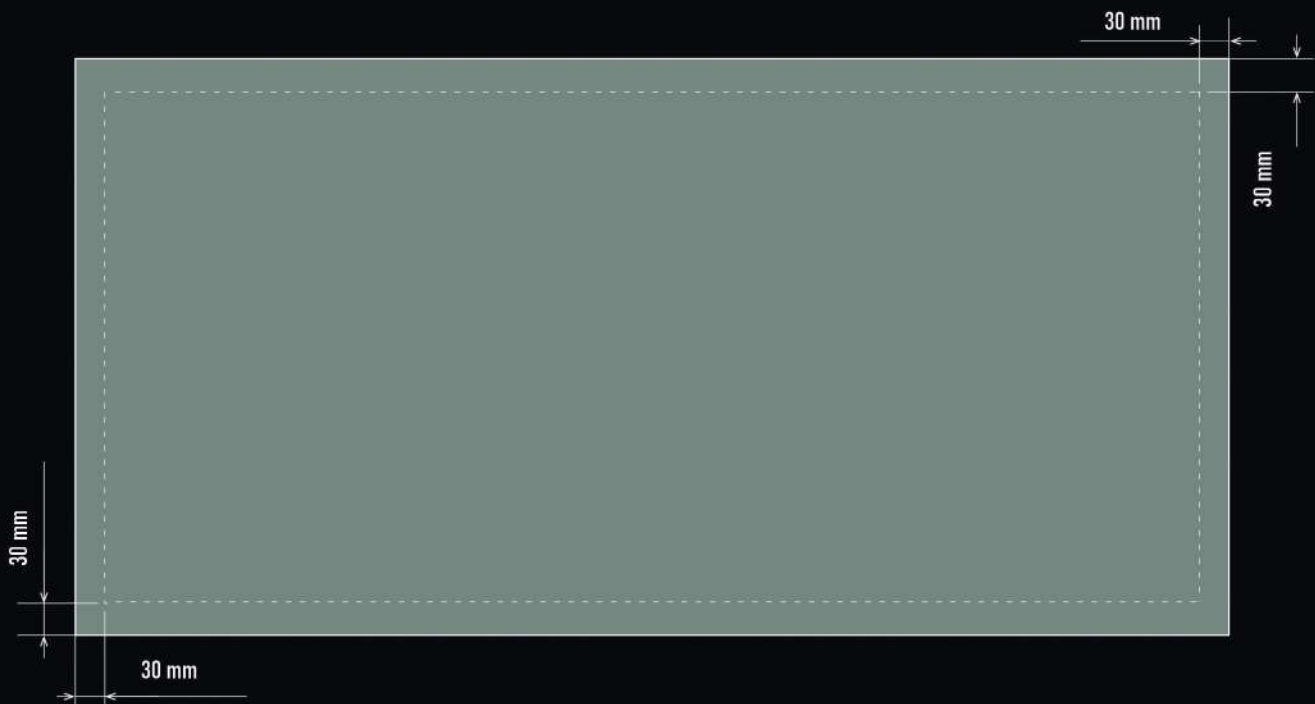
The following edges are recommended for both aesthetics and practicality.



4. FABRICATION OF LAMAR PORCELAIN SLABS

It is strongly recommended that correctly calibrated porcelain wet cutting and drilling equipment is used. If wet cutting and drilling equipment is not available, then adequate extraction on the equipment must be in place and adequate personal protective equipment (PPE) must be worn by everyone in the vicinity of the fabrication process. The PPE must be specified to enable the safe fabrication of porcelain slabs.

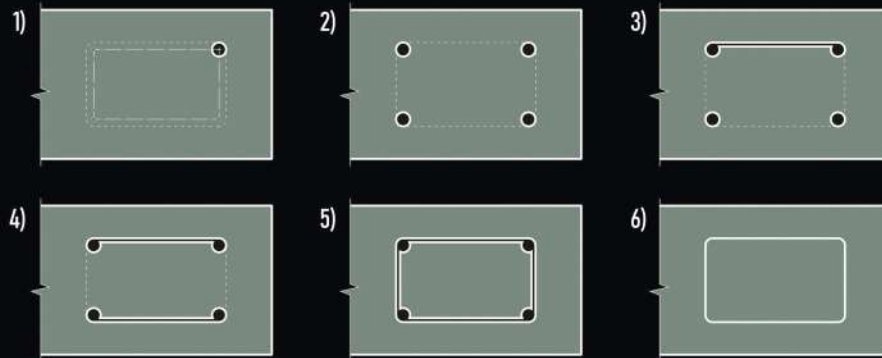
The cutting and drilling equipment must be designed for porcelain fabrication and the cutting and drilling blades must be diamond tipped and designed for cutting porcelain.



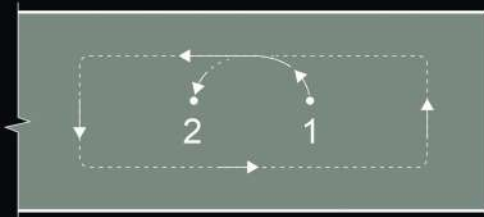
4.1 THE PROCESS

- Before any cutting or drilling operation, clean the surface where the slab will be machined.
- Vibrations in the slab whilst cutting or drilling must be minimised to reduce the risk of breakage. To ensure this, place a secure and perfectly flat wooden or rubber panel beneath the slab.
- It is recommended to remove approximately 3 cm from all sides of the slab to release the slab's internal tension. Make sure to cut the long sides before the short side. Before the fourth cut is commenced, it is advised to pre-cut part of the exit.

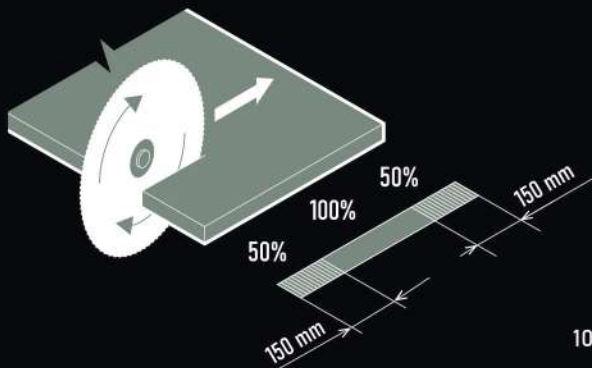
- When making any cut-outs first drill holes on the inside of the four corners of the cut-out. The drill must have a minimum diameter of 20mm. Then cut along the perimeter of the cut-out to join the four holes. A modified version of this process should be used when creating an L-shape from a single slab.



- For cut-outs using water-jet or cnc equipment, the process must have one continuous cut which starts from the inside of the cut out.



- When making a straight cut the feed rate should not exceed 50% of the maximum rate at the start and at the end of the cutting process. The feed rate can be progressively increased to 100% as the disc moves towards the centre of the slab and progressively decreased to 50% as the disc moves away from the centre of the slab.



4.2 PARAMETERS

■ For Disc Blade Cutting

The recommended blade diameter is 400 mm and the parameters below are based on that recommended diameter.

SLAB THICKNESS	RPM	STRAIGHT CUT SPEED (mm/min)	45° ANGLE CUT SPEED (mm/min)
12mm	1900 - 2150	1.0 - 1.5	0.5-0.7
20mm	1900 - 2150	0.7- 1.0	0.4-0.5

■ For Water Jet Cutting

HIGH PRESSURE FOR CUTTING (BAR)	LOW PRESSURE FOR HOLES (BAR)	FEED RATE LAMAR 12mm (mm/min)	FEED RATE LAMAR 20mm (mm/min)	CUTTING ABRASIVE	DRILLING ABRASIVE
3500 - 4000	600	0.8 - 1.0	0.4- 0.6	Mesh 80 300 g/min	Mesh 80 100 g/min

■ For CNC Machine Cutting

CROWN BIT FOR INITIAL HOLE		CUTTING TOOL		FLUSH TOP	
RPM	FEED RATE (mm/min)	RPM	FEED RATE (mm/min)	RPM	FEED RATE (mm/min)
1500 - 3000	15-20	3000-3500	150 - 200	4500 - 5500	150 - 200

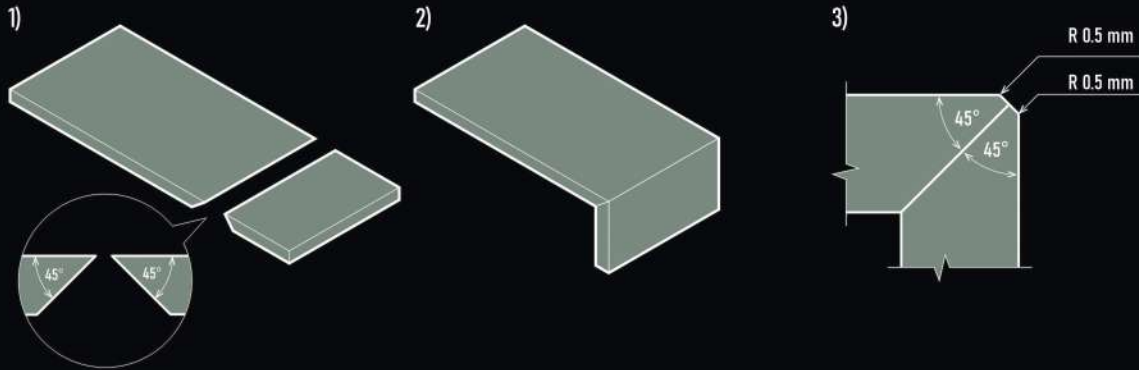
Suction pads must be positioned correctly to support all parts of the slab including the parts to be cut out. The suction pads must be placed in an evenly distributed pattern so the weight is also distributed evenly across all sections of the slab and none of them move during or after the process.

The cutting must be done 0.5mm at a time for the initial passes, then 3 mm for subsequent passes.

4.3 DROP DOWN EDGES

Seamless drop down edges can be produced using a mitered edge joint.

The 3-step process shown here also recommends the use of a 10mm chamfer edge finish (see image no 3)



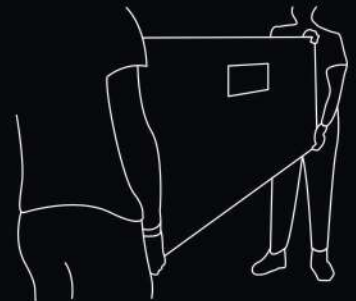
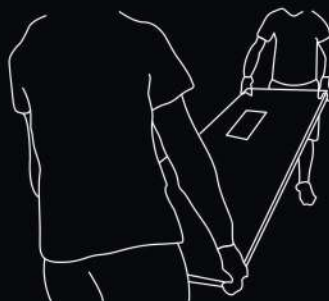
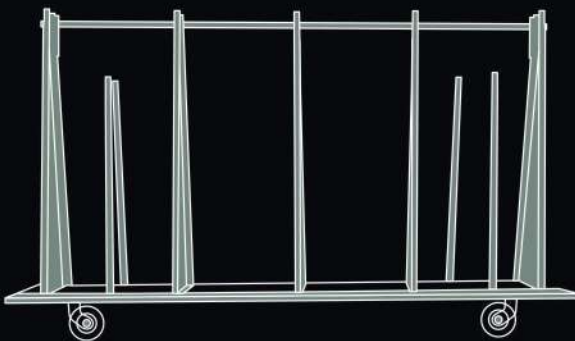
5. INSTALLATION

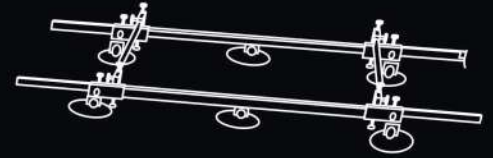
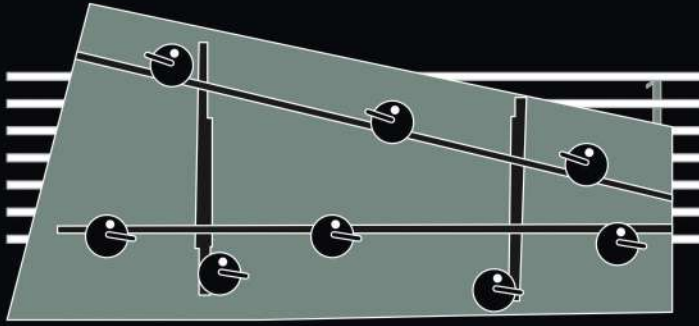
5.1 ON-SITE HANDLING

- The full slab must be in a vertical position whilst being moved around at the installation site. While moving any cut-outs manually, if there, should always be moved/stored vertically facing cutwork upwards when the slab is being transported or is at rest.
- The slab can be moved around using a slab cart or a frame with vacuum suction which can be rearranged based on the cutting of the slab.

INCORRECT ✗

CORRECT ✓



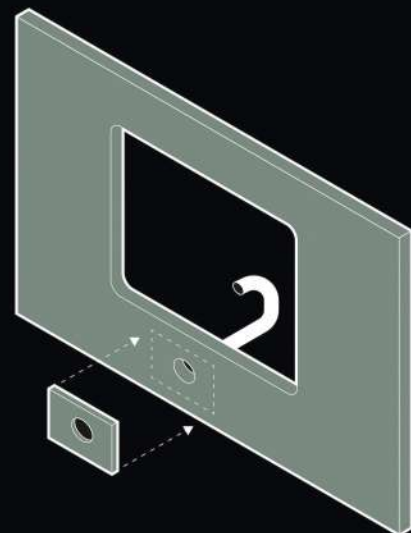
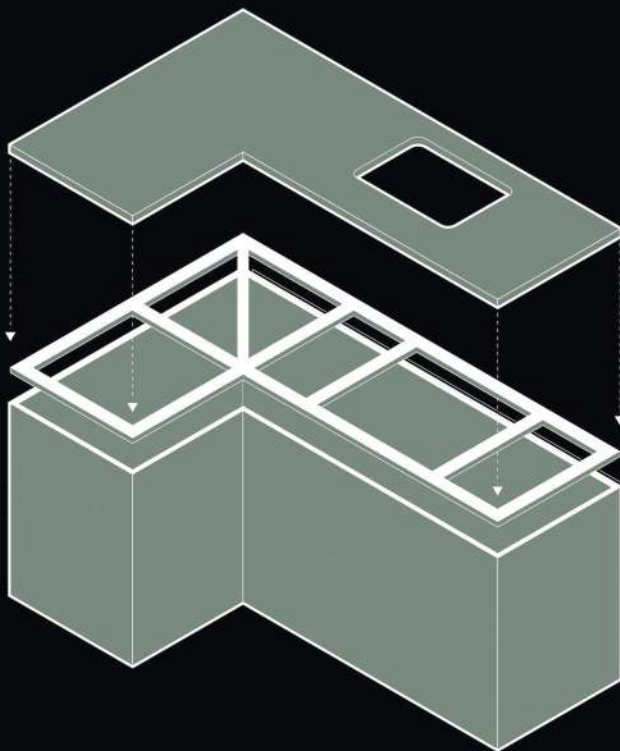


5.2 LAYING

Before laying the slabs, please ensure that the base surface is smooth without any debris. It must also be a completely even and level surface.

As noted previously, it is good practice to ensure at least a 2 mm joint gap between any two slabs, or between a slab and another surface or object. The joint gap can be filled with a suitable sealant which matches the base colour of the LAMAR design.

If there are any cut-outs on the slab, they should be supported by reinforcements near the joints and the surface. Any fittings on the slab, such as taps, must also be supported at the drilling site with a reinforcing pad.



5.3 BONDING

To bond LAMAR surfaces together it is recommended to use a 2-component epoxy adhesive or Methyl methacrylate adhesive (MMA) in as similar colour to the base colour of the slab as possible.

The following steps ensure a proper bond :

- Always clean and dry the surfaces that are to be glued thoroughly.
- Attach adhesive tapes on the outer sides of both surfaces to be glued. This can be peeled off later.
- Some parameters like the mix ratio, how much time the glue takes to harden after mixing vary from adhesive manufacturer to manufacturer and must be taken note of before proceeding on with the glueing.
- After the two surfaces have firmly glued together, mask the bonded edge with paper masking tape before grinding and polishing the edge.

When installing LAMAR slabs onto other non-porcelain surfaces, either a 2-component epoxy/Polyurethane glue can be used or a polymer-modified mortar (do check if it is specified for large format slabs).

It is recommended to do a sample test first.

6. CLEANING AND MAINTENANCE

6.1 EVERYDAY CARE

LAMAR porcelain slabs are waterproof and highly stain resistant. Hence dirt and stain cannot penetrate the surface. This is what makes LAMAR slabs perfect for worktops in the kitchen , bathroom and everywhere else

To clean porcelain slab surfaces, LAMAR recommends using a neutral soap with warm water solution with a sponge or cloth. Do not use products containing wax or any substance which may form a film on the slabs.

6.2 SPECIFIC STAIN REMOVAL

LAMAR recommends a preliminary cleaning with warm water and mild detergent. If that does not serve the purpose, we recommend the following for removing stubborn stains. Do not use any harsh detergents or abrasive sponge.

- Alkaline Solutions like Basic Cleaning Agents and Ammonia for Grease and Oil, Wine, Ice Cream and Coffee stains.
- Oxidants such as Hydrogen Peroxide and diluted Bleach for Beverages and Nicotine stains.
- Solvents like Universal Solvent, Acetone, Alcohol and Turpentine for Ink, Resin, Nail Varnish, Candle Wax and Asphalt stains.
- Acids like Limescale Remover (lemon juice and vinegar) for residual cement, gesso, graphite stain and marks left by metal objects.
- Rinse with water and dry the surface with a clean cloth or a paper towel after application of any of the above agents.

6.3 DOs and DON'Ts

Dos

LAMAR slabs can withstand heat from everyday utensils, which can be placed directly on the slab surface, straight from the oven or hob.

Use a soft sponge, cloth or paper towel to clean the surface, depending on the type of cleaning products you are using.

To eliminate dried food or other stubborn residues from the surface, use a wooden or plastic scraper.

DON'Ts

Avoid exposing LAMAR slabs to high temperature heat sources like chimneys. Also avoid direct exposure to open flames.

Do not use an abrasive sponge or metal scouring pad.

Do not use any sharp metallic object on the countertop surface

TECHNICAL SPECIFICATION

PROPERTY (All tests based on EN ISO:10545)	STANDARD	LAMAR 12mm	LAMAR 20mm
REGULATORY PROPERTIES			
Deviation in Length and Width	0.5%	0.01%	0.02%
Deviation in Thickness	5.00%	0.50%	0.40%
Straightness of Sides	0.50%	0.03%	0.04%
Rectangularity	0.50%	0.02%	0.05%
Surface Flatness	0.50%	0.05%	0.05%
Surface Quality	No defects observed in 95% slabs	Conforms	Conforms
MECHANICAL PROPERTIES			
Water Absorption	<0.6%	0.02%	0.03%
Bulk Density	As per Mfg	2200-2400kg/m ³	2200-2400kg/m ³
Modulus of Rupture	Min 35N/mm ²	36 N/mm ²	36 N/mm ²
Breaking Strength	Min 1300N	3214 N	9266 N
Impact Resistance	No cracking on consistent impacts	No Indentation/ Cracking	No Indentation/ Cracking
Surface Abrasion Resistance	As per Mfg	Class 3; Passed 600 Revolutions	Class 3; Passed 600 Revolutions
Moh's Hardness	As per Mfg	5-7	5-7
Frost Resistance (Visual defects after 100 freeze thaw tests)	No damage	No damage	No damage
Thermal Shock Resistance	No damage	No damage	No damage
Moisture Expansion	Max 0.6 mm/m	0.1 mm/m	0.1 mm/m
Thermal Expansion	Max 9.0x10 ⁻⁶	2.52x10 ⁻⁶	2.79x10 ⁻⁶
Crazing Resistance	As per Mfg	No crazing	No crazing
CHEMICAL PROPERTIES			
Chemical Resistance (Class A better than Class B and so on)(incl. Household Chemicals, Swimming pool salts, acids and Alkalis)	Min Class B	Class A	Class A
Stain Resistance (Class 2 better than Class 1 and so on) (Staining Agents: Light oil, Iodine Alcohol Solution and Olive oil)	Min Class 3	Min Class 5	Min Class 5
Lead Release	0.8 mg/dm ²	Not Detected	Not Detected
Cadmium Release	0.7 mg/dm ²	Not Detected	Not Detected
Fire Resistance	As per Mfg	Class A1	Class A1

Technical data above and parameters in the manual are only to show indicative values for product features.

