



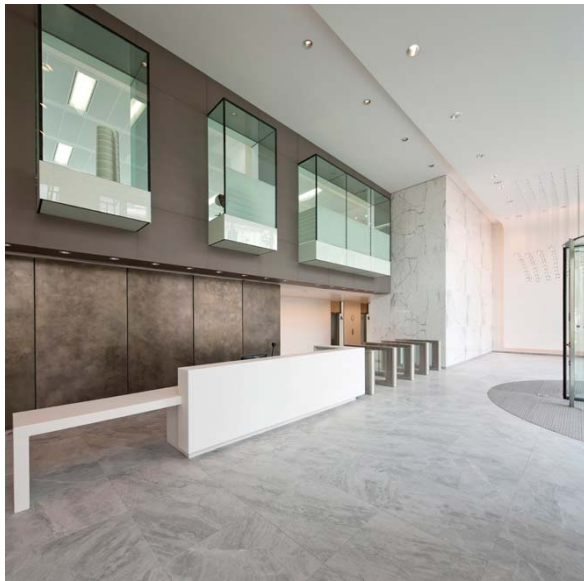
Natural Stone Counter Tops Code of Practice

DESIGN | MANUFACTURE | INSTALLATION and MAINTENANCE of natural stone counter tops - including

- kitchen worktops
 - reception desks and
 - other similar horizontal and associated vertical surfaces
- for use in domestic and commercial situations.



Federation
Stone
Great Britain



Code of Practice – Natural Stone Counter Tops

Stone Federation is the official trade association for the natural stone industry with over 100 years' experience in connecting architects, designers, specifiers and clients with the finest stone professionals.

We are passionate about promoting natural stone as the building material of choice as well as positioning ourselves as the source for all things stone.

Stone Federation provides an invaluable aid to all those seeking sources of natural stone or wishing to employ a specialist natural stone professional.

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Code of Practice – Natural Stone Counter Tops

1.0 Introduction

This Code of Practice gives guidance for the design, manufacture and installation of natural stone for use as counter tops, kitchen worktops, reception desks and other similar horizontal and associated vertical surfaces for use in domestic and commercial situations. It includes the appropriate selection of stone and also deals with the requirements of the support method for the stone.

Natural stone is used as horizontal and vertical surfaces for a number of applications these include;

- a) Kitchen worktops, splash backs and free standing 'island' tops.
- b) Counter tops, bar tops, servery tops and restaurant tables.
- c) Reception desk tops.

For the purpose of this Code all worktops and splash backs are referred to as horizontal surfaces.

This Code of Practice refers to stone used in a range of locations including:

- a) Domestic residences
- b) Public buildings
- c) Restaurants and cafes
- d) Hotels
- e) Offices.

The common issues encountered with natural stone horizontal surfaces relate to:

- a) The incorrect or inappropriate selection of stone
- b) Poor detailing
- c) Poor workmanship
- d) Inappropriate or incorrect maintenance instructions
- e) Insufficient understanding of the issues involved.

2.0 General types of natural stone

2.1 Classification

There are many different classification schemes for stone which have prompted the industry to simplify classification. This has led to many misunderstandings when, for instance, a stone claimed to be granite is actually found to be a different stone type altogether and does not perform as expected. The British Standard BS EN 12440 Denomination of Natural Stone addresses the classification problem and insists upon the correct identification of stone type and its origin. For the purposes of this guidance, the simplified industry classification remains and it should be stressed that all stones must be considered individually for their merits when used as horizontal surfaces.

2.2 Granite

The term granite has been applied to almost any igneous stone that can retain a polish. True granites provide many of these stones but other types of stone that may fall into this classification include syenites, gabbros, dolerites, and diorites. Gneisses and schists are metamorphic rocks that are sometimes included in this category.

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The formation of igneous rocks is by the cooling of molten materials to form minerals such as quartz, feldspar and hornblende, resulting in a wide variety of colours and grain patterns. The interlocking crystal structure imparts both the high strength and low porosity necessary for a wide range of applications. These characteristics are also important in allowing successful use of slabs that are thinner than other types of stone.

UK granite is available from Cornwall and Scotland whilst the main sources for imported granite are currently Scandinavia, South Africa, Sardinia, Portugal, Spain, India, North America, Brazil and China.

The immense colour choice includes fine and medium grained silver grey from Cornwall, Dumfries and Aberdeen whilst other countries provide dense, very fine grained materials with reflective crystals such as larvikite (eg. blue and emerald pearl) from Norway; reds from Scandinavia and India; large grained brown from Finland; yellows from Brazil; and the delicately mottled greys, fawns and pinks from Sardinia and Spain. Portugal, South Africa, India and China also produce a wide variety of materials.

2.3 Slate

The term slate is often used to describe any rock that can be easily split into thin sheets. True slate is defined by the presence of a 'slaty' cleavage; this allows the slate to be split at almost any point through the stone parallel to the cleavage plane. Most true slates are metamorphosed sediments, often formerly mudstones; however, some British "slates" are derived from volcanic ash sequences.

The major UK sources of slate, with their distinctive colours, are the Lake District (blue/grey, light green, olive green and silver grey), North Wales (blue, grey, blue-black and red), and Cornwall (grey).

Slate used for building is typically a very durable construction material and rarely exhibits visible degradation, even when placed under extreme atmospheric conditions for many years. As horizontal surfaces, UK slates of good quality are unlikely to delaminate or exhibit efflorescence.

High flexural strength and typically very low porosity frequently makes slate suitable for use as horizontal surfaces. UK slate may typically be of high flexural strength but this is not always true of imported material.

Caution should be exercised when choosing material marketed as slate as some may not be suitable for use as horizontal surfaces. If any doubt exists about the material being considered, specialist advice should be sought from a member of Stone Federation.

2.4 Limestone

Limestone is a sedimentary rock. Many of the commonly used varieties were formed by the accretion of the hard remains of former organisms such as corals and shells. These materials principally comprise calcium carbonate (calcite), as does the cementing matrix. Calcite is a relatively soft mineral and places many restrictions on the way limestone may be used. Variations in the types and quantities of shell and other remains and the nature of the cement provide a huge range in the colours and textures of limestone available.



Hard limestones, most commonly used for horizontal surfaces are mainly imported from French, German, Portuguese and Spanish quarries. The colour of these limestones ranges from almost white to black with almost any colour available in between.

There are few hard limestones available in the UK, notable exceptions being the Purbeck Marble (not a true marble, see below) and Portland Blue. Most UK limestones do not take a polish and are typically cream, buff, brown, grey and blue in colour. Textures range from fine even-grained stones to the smooth fossil bearing types and to the coarse open textured. Finishes including honed, sawn, flame textured and chiselled are also offered.

Careful selection is needed when selecting limestone for use as a horizontal surface, particularly with respect to stain resistance and surface scratching. Application of suitable surface treatments to improve resistance to staining should be given careful consideration.

Other features to consider include veining, which can be a source of weakness or create problems with aesthetics. Some hard limestone, often referred to as marble and containing pronounced veining and/or fracturing, require reinforcement matting glued to the underside. Stylolites are a feature of hard limestones that can also lead to surface imperfections or cratering and their presence and soundness should be assessed.

2.5 Marble

True marbles in the geological sense are metamorphosed limestone and are principally composed of recrystallised calcite formed into an interlocking granular structure. Some hard or partially metamorphosed limestones are incorrectly referred to as marble, even though they exhibit many of the characteristics of marble.

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In its 'purest' state marble is typically white or light-coloured, however the presence of other minerals can often provide colour(s). In some cases the colour appears as irregular shaped patches (brecciation) or as substantial veining which commonly require reinforcement matting glued to the rear face. Specialist advice should be obtained as to the suitability of such marbles in particular locations.

Great care must also be taken during installation as other construction defects easily taint the 'pureness' of marble, particularly from underlying materials, and may result in staining at a later date.

Marble is largely imported from many locations around the world including Italy, Romania, Bulgaria, India and China.

All types of marble are traditionally used in bathrooms and bedrooms. By its nature marble is susceptible to staining from spilt acidic liquids (which can include perfume, aftershave, toothpaste etc.) and its selection and use should be carefully considered.

2.6 Green Marble or Verde

Verde or green marble is considered separately to true marble because its origin is often the result of the metamorphism of rocks other than limestones. The green colour is typically derived from the presence of serpentine minerals. These minerals are relatively soft and the structure often weak, the stone commonly requiring reinforcement from matting glued to the underside.

Verdes have limited use, the most common being vanity tops. Generally the use of verdes in any location where there may be persistent moisture is not advised as the minerals can be sensitive to such action, possibly causing a dulling effect.

A special consideration for any verde is the presence or otherwise of asbestiform minerals that may be naturally present eg. chrysotile and the amphiboles tremolite and actinolite. It is important to establish that, where present, fibres of these minerals in the respirable range are not generated during any cutting, grinding and polishing operations - particularly if carried out dry.

2.7 Quartzite

Quartzites are typically the metamorphosed product of an original sedimentary rock, eg. sandstone, composed almost entirely of quartz.

In general quartzites are hard wearing, have low water absorption, a high compressive strength and good durability. The metamorphic varieties in particular may be brittle and so some care is required in assessing a material prior to use.

While composed largely of quartz, the presence of some impurities can lead to the development of different colours and the typical range is from white to yellowish brown, through to green, brown, gold, grey and blue. In Eire the metamorphic quartzites have a complex geological history which has tended to result in them having a relatively small natural block size.

All operating quartzite quarries in the British Isles occur in Eire. Elsewhere quartzites are commercially available from Norway, Sweden, Italy, South Africa, USA, China and Brazil.

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2.8 Sandstone

Sandstones, even hard ones, do not readily take a polish due to their more gritty texture, unlike fine grained hard limestones which will sustain a polish. This makes sandstone more susceptible to absorbing liquids which could potentially give rise to health issues, becoming stained and therefore not suitable for kitchen worktops. However, sandstone would be suitable for reception desks.

2.9 Performance Characteristics

When selecting natural stone for use as horizontal surfaces the specifiers (designer or customer) must satisfy themselves that it is suitable for use in the intended application. Stone Federation members will provide the necessary test data and comments where the use and suitability of the chosen stone in a similar application cannot be successfully demonstrated.

All testing must be carried out using Harmonised European Test Methods (BS EN Standards).

Any testing undertaken or results declared should include:

- i) Petrographic examination BS EN 12407
- ii) Water absorption BS EN 13755 and/or
- iii) Porosity and density BS EN 1936
- iv) Flexural strength BS EN 13161.
- v) Determination of sensitivity to accidental staining; BS EN 16301.

When selecting any natural stone it is important that the predicted use of the horizontal working surface is considered. For most kitchen worktops, counter tops, bar tops, servery tops, restaurant tables and reception desk tops, granite or slate would normally be selected. Whatever natural stone is chosen it must have low absorption and must be hard enough to resist excessive scratching. Resistance to scratching can be checked using the Mohs' scale of hardness.

2.10 Mohs' Scale of Hardness

Hardness is one of the most important physical properties when selecting stone for use as a horizontal surface. Each specific material has a hardness, which can be related to the scale defined by Friederich Mohs in 1812. The scale arranges ten minerals in an order such that each would scratch those lower in the scale. To use the scale it is necessary to know the true petrological family of the stone and its main mineral constituents. Where there is no history of the stone having been used as a horizontal surface in the proposed application, reference to the scale will assist.

10	Diamond	Diamond is the hardest mineral
9	Corundum	Scratches everything but diamond
8	Topaz	A hard file will scratch topaz
7	Quartz	Quartz will scratch glass
6	Feldspar	A good pocket knife blade will scratch feldspar but not quartz
5	Apatite	A steel knife will scratch apatite
4	Fluorite	A copper coin will just scratch fluorite
3	Calcite	A knife blade easily scratches calcite
2	Gypsum	A finger nail can scratch gypsum
1	Talc	Softest material

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For example, true granites such as De Lank, have a hardness between 6 and 7. This is also true of black 'granites' such as Nero Assoluto, Belfast Black and Angolan which have a hardness of 6. Whilst Indian Black (also referred to as Absolute Black) and Star Galaxy Black has a hardness of 5 to 6 and is more susceptible to scratching.

Marble such as Carrara and Statuary has a hardness of 3 to 4 whilst hard limestones such as Purbeck have a hardness of 3; these stones are clearly susceptible to scratching by metallic objects. Normal limestones have a hardness of 3 and below.

It can therefore, be seen that softer stones and those with higher absorption and/or lower stain resistance may not be suitable for use in kitchens in high occupancy accommodation.

This illustrates the need for careful selection to ensure that surface scratching does not result in short to medium term surface deterioration. The stone selected should also be able to resist surface staining from spilt liquids and be capable of accepting appropriate cleaning regimes (See also clause 10). Granite and slate would typically fall into this category.

2.11 Selection

Aesthetic considerations are usually paramount when selecting natural stone for horizontal surfaces; however, the following general points also have to be considered.

Choosing a stone that has a proven track record in use as a horizontal surface will generally reduce selection problems. In major commercial projects or where large amounts of stone are to be used, some testing should be considered to ensure that the stone supplied is equivalent to that upon which the assumptions of suitability are derived. If experience in the use of the stone selected is scarce, greater testing, including a petrographic examination, should be considered.

There are size limitations on all types of natural stone that are caused by geological conditions within the quarry which can affect the size of the raw quarry blocks from which the slabs are produced. The slabs, site conditions for handling and sometimes the material itself will determine the size of granite, marble, hard limestone, slate, sandstone and quartzite that can be produced as horizontal surfaces. The thickness required for any natural stone horizontal surface depends on its use and the extent of support provided by the substrate construction.

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The following table provides some initial guidance, but does not obviate the need for assessment of suitability in individual cases.

Suitability of natural stone

Stone type	Kitchen worktops	Counter tops	Bar tops	Servery tops	Restaurant tables	Reception desks
Granite	A	A	A	A	A	A
Slate	B	A	A	B	A	A
Limestone	C	B	C	C	C	B
Sandstone*	-	-	-	-	-	D
Marble	C	B	C	C	B	B
Quartzite	A	A	A	A	A	A

Key:

A = Materials that can be used in all situations and where the risk of damage is extremely low.

B = Care is needed when using sharp objects not to scratch the surface.

C = Although these materials have been used in all situations it must be realised they are not as hard as A or B materials and suitable precautions must be taken.

D = Only the hardest material should be considered.

* Sandstones are only recommended for reception desks and only the hardest material should be considered.

Apart from the hygienic aspect, any food preparation should be done on a chopping board to reduce the risk of damage to the surface of the worktop.





2.12 Samples

Often the finished worktop supplied does not precisely match the sample provided and/or natural markings and variations which occur in the material are deemed unacceptable and result in rejection.

Small samples only 100mm x 100mm should not be used for the final selection of horizontal surfaces and should only serve to indicate the typical colour and appearance of the stone.

Due to the mineralogy, the surface finish of many stones, including granite, exhibit minor surface blemishes when polished. These may appear as small pits and are often the cause of rejection. Where these are likely to occur their presence should be brought to the attention of the designer/customer and should be present in any samples provided. Stones that exhibit these features may be regarded by some designers/customers as being unsuitable.

When selecting the stone at the design stage the samples should be of sufficient quantity and size to show the full range of variations that can be expected.

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2.13 Finish

The finish expected has to be agreed as this can have a considerable effect visually eg, unpolished marble can look dead and uninteresting against the polished finish. The slabs selected for the horizontal surfaces will frequently be polished at the primary production stage, when often any surface imperfections are resin filled. With secondary working involving hand polishing (eg. edge polishing), it is not always possible to achieve the same degree of polish and where this is not achievable it should be agreed with the designer/customer prior to manufacture. Note: most stone is now filled with a clear epoxy at primary production stage. This is carried out to reduce the amount of rejection due to small crevices, pitting and natural cracks that are present in many stones and is normal practice.

Stone should be carefully laid out to ensure that the marking, veins and particulars of the individual slabs are within the tolerance range of the approved sample(s). Markings (if any) should all run in the same direction (ie. left to right, top to bottom, or diagonally) so that all slabs are consecutive from the block. Checks should be made that all slabs are properly finished and are flat. If they are concave or convex to such a degree that the finished work will not be flat to within tolerance, the stock should be rejected.

The texture of some natural stones often results in a "rippling" effect appearing on edges and faces that are hand polished. Where this is likely the mason should take the necessary action to reduce the effect. The texture of some natural stone can result in a "rippling" effect on the surface even when machine produced. Where this is likely to occur the fabricator/installer should advise the designer/customer accordingly.

The rear face of the slab will have a sawn finish or may have a fibre glass matt applied. Overhangs, and if required, the rear face of the slab, can be polished. The finish however, will not match the top face.

2.14 Labelling

The samples of stone should be labelled as follows:

"As stone is a natural material and subject to variations in colour, pattern and texture, this sample is indicative only".

All stone samples supplied must be identified and labelled in accordance with BS EN 12440:2001 "Natural Stone - Denomination criteria" – ie, the traditional name, petrological family, typical colour and place of origin.

On contracts where large volumes of stone are used, it is recommended that the "decision makers" regularly visit the production plant and/or quarry to ensure that the agreed samples still represent the material being produced.

Where large scale samples are not available, before final selection the customer should visit the stone yard and view and approve slabs from which the counter top will be produced. Where a large quantity of stone is to be used, the slab selected should show the full range of variations in colour and finish that are likely to occur.

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When viewing polished slabs at the stone yard, the weather conditions should be considered. The appearance of the slabs seen stacked vertically and in bright natural sunlight will change when installed horizontally under electric light. This should be taken into consideration during final selection.

The manufacturers should ensure that the selected slab is signed as approved by the designer/customer using indelible ink which is weather and wear proof.

If the designer/customer is not prepared to, or is unable to, undertake final selection then it is critical that the samples offered show the full range of variations that are likely to be present in the installed horizontal surfaces.

2.15 Impregnators

Competent installers will apply an impregnator to the stone following installation in order to reduce the possibility of surface staining and improve the maintenance and cleaning requirements. Where an impregnator has been applied, it is essential to use compatible cleaning products when cleaning the natural stone surfaces so as not to compromise the efficiency of the impregnator. It is also recommended to reapply the impregnator at 2-3 years intervals. The application of an impregnator may affect the colour and aesthetics of the stone but this will often be minimal and you should seek advice from the manufacturers.

2.16 Supporting Structure

The cupboards and cabinets onto which the natural stone horizontal surfaces are seated must be capable of safely carrying the load imposed by the horizontal surface and any predicted additional imposed loads.

2.17 Typical weight of stone

For the purpose of design, the weight of natural stone used for all types of counter/work tops should be based on 280 kg/m³. The weight for the various thickness of stone used would be as follows:

Weight – kg per m ²		
20mm thick	30mm thick	40mm thick
60	90	120

The carcass of any cupboards or cabinets must be rigidly secured back to the walls. Continuous battens should be attached to the backing wall and will provide additional rigidity and support. It is important that whilst providing adequate support, that this must not deflect so far as to allow the stone to crack (figure 1).

The supporting structures should be sufficiently level, clean and even to receive the natural stone surfaces.

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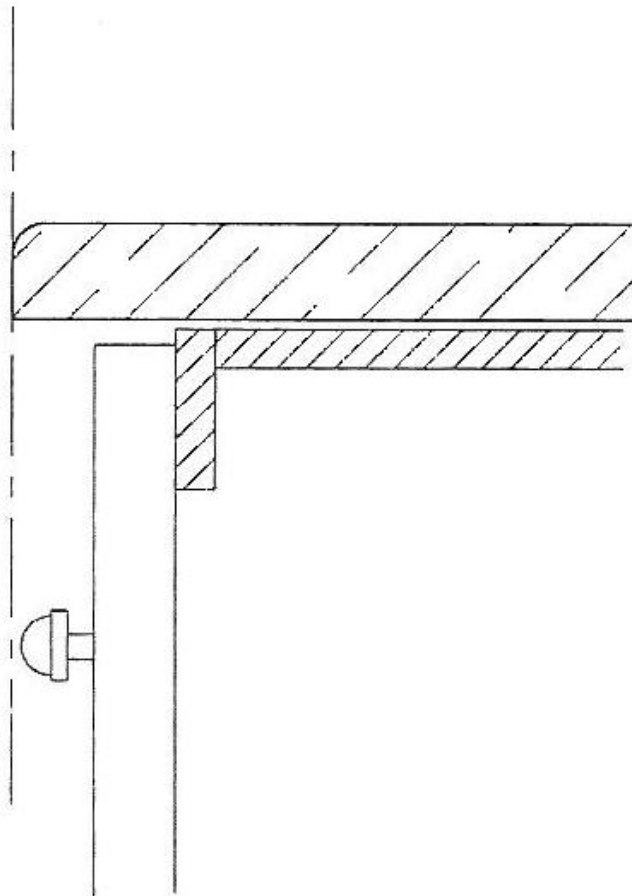
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3.0 Design

The designer should establish that the stone selected is suitable for its proposed use. For example, stones with high water absorption and porosity may not be suitable for use in kitchens or bathrooms. Where such stones are selected for aesthetic reasons the designer/supplier should advise the customer accordingly and provide information on any additional maintenance regimes that would be required.

The worktop should be designed to align with or project beyond the face of any door or drawer handles (figure 2).

Figure 2

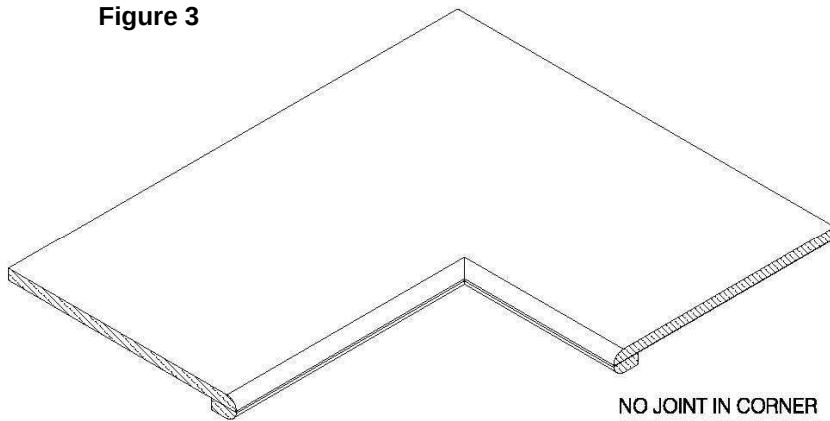


For normal situations the overhang is 20mm from door or drawer face. Where handles with a greater projection are being used the designer/customer should advise the fabricator/installer.

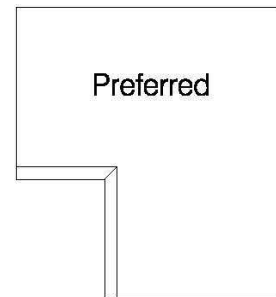
The design should show the method of jointing required at the corners (figure 3). Where this is not specified, the detail should be agreed before fabrication commences. Drawings showing all cut-outs should be supplied (figure 4).

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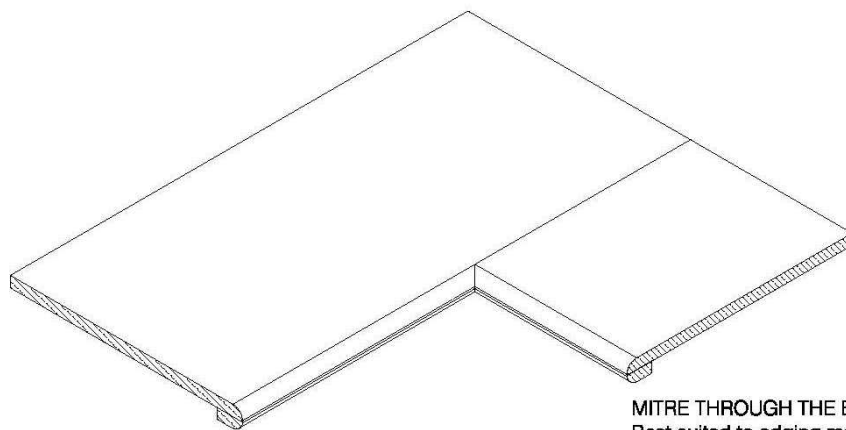
Figure 3



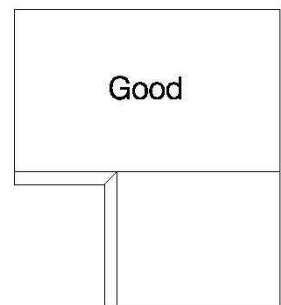
NO JOINT IN CORNER
Cleanest looking. Some hand grinding required in corner. Uses up more of material to make corner.



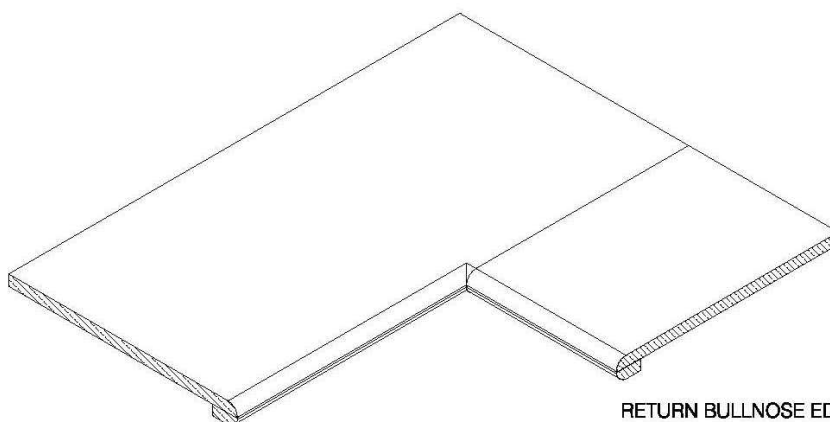
Preferred



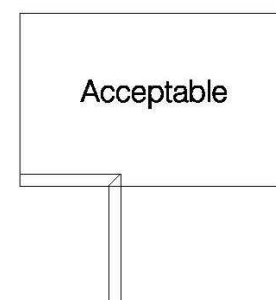
MITRE THROUGH THE BULLNOSE EDGE
Best suited to edging machines, requires no grinding on the nose.



Good



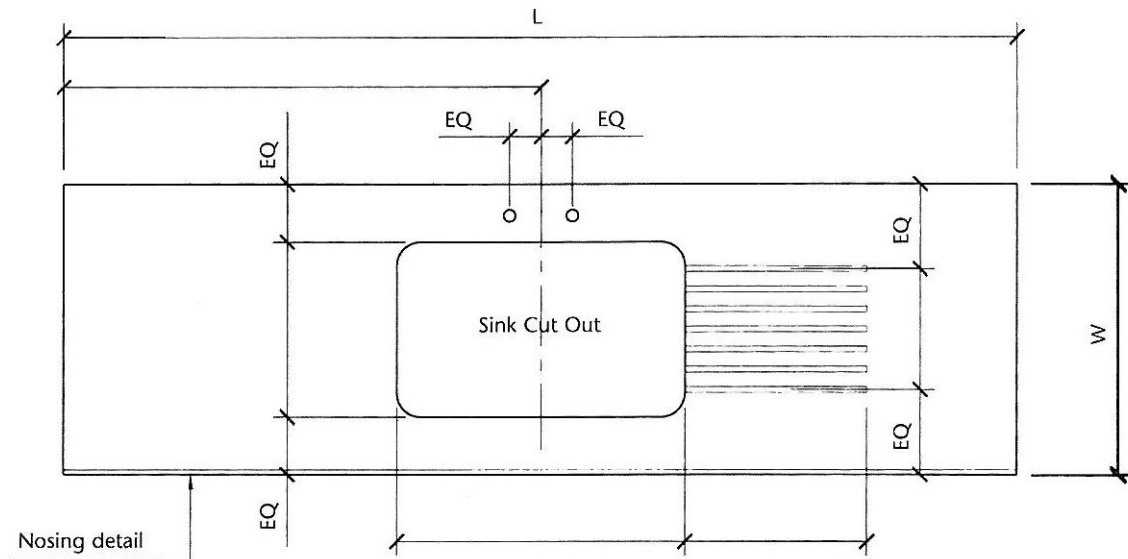
RETURN BULLNOSE EDGE INTO JOINT
Some hand grinding required for the edge return.



Acceptable

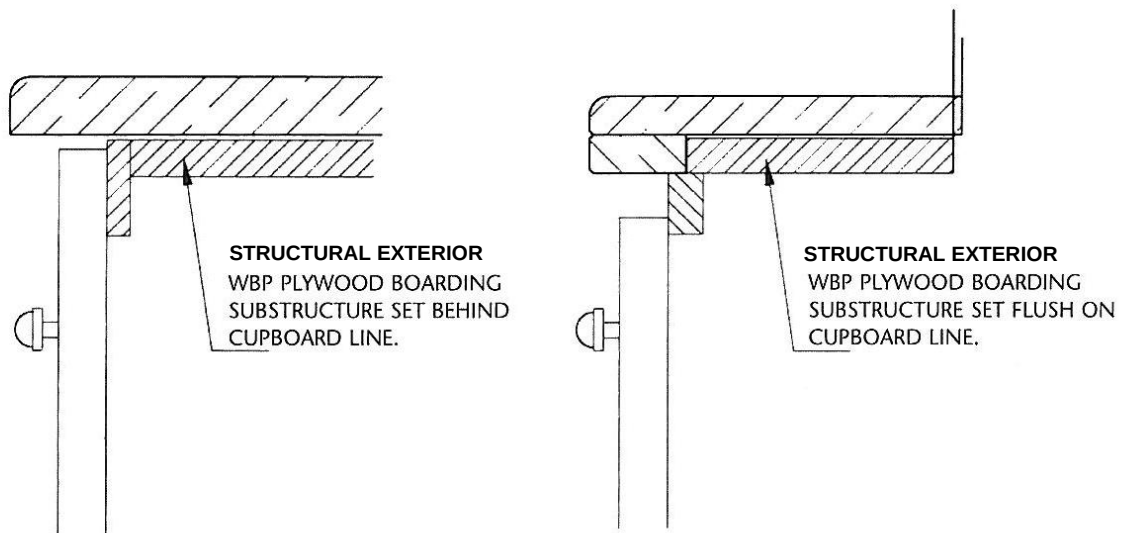
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Figure 4



Marble, granite and limestone at 20mm thick is not capable of free spanning. A continuous water and boil proof (WBP) plywood or suitable cementitious backer board supporting structure must be provided. The WBP plywood or backer board should be installed flush with or recessed behind the face of the cabinet or cupboard and coordinated with the design of the natural stone worktop (figure 5).

Figure 5



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Other types of board (including waterproof MDF) must not be used as a support substrate for natural stone surfaces.

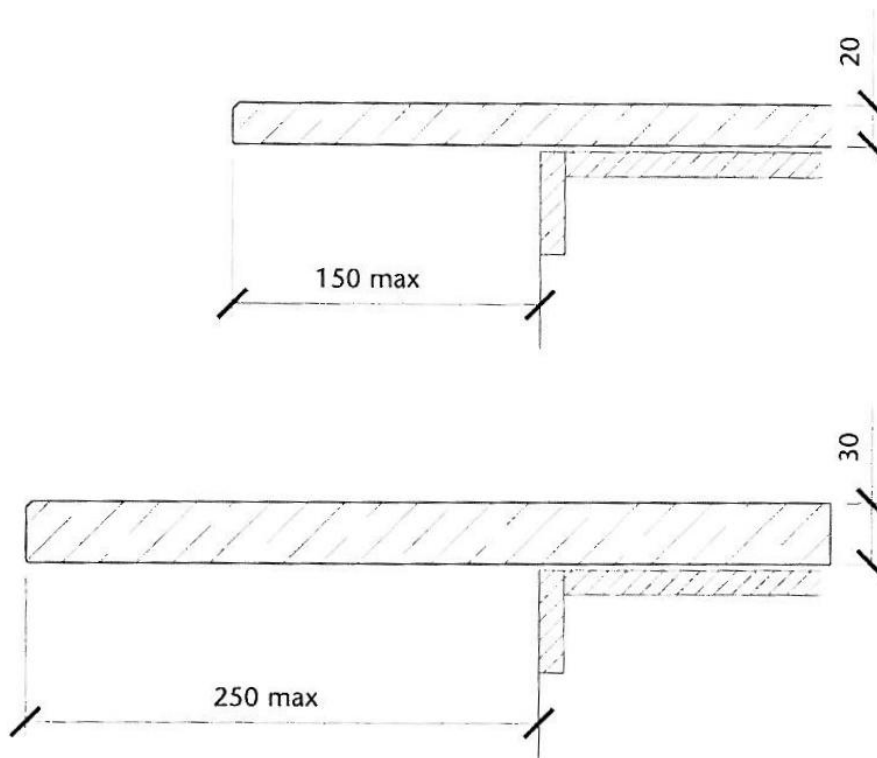
The plywood or cementitious backer board must be in position before templates are taken. Where structural exterior plywood is used, its rear face and edges should be sealed with diluted PVA or varnish prior to installation. This will ensure that the plywood does not absorb any moisture resulting in minor movement. The plywood should be allowed to acclimatise before installation.

Where 20mm thick slate is used it may be capable of spanning between the cheeks of the carcass without the need for a supporting substrate but this will depend on its flexural strength.

Marble, granite and limestone at 30mm thickness is not capable of free spanning more than 600mm. Where this is exceeded, continuous WBP plywood or cementitious backer board substrates must be provided.

20mm thick marble, granite, limestone and slate must not have an unsupported overhang of more than 150mm. This can be increased to 250mm for 30mm thick stone (figure 6). Where an overhang occurs, it is essential that the supported area of the horizontal surface is firmly secured in place to ensure that when the overhang is loaded, it will not result in failure of the remainder of the installation.

Figure 6

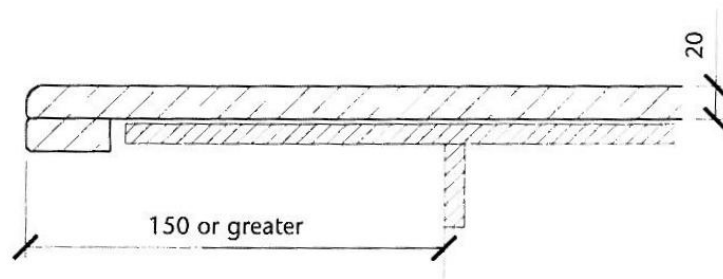


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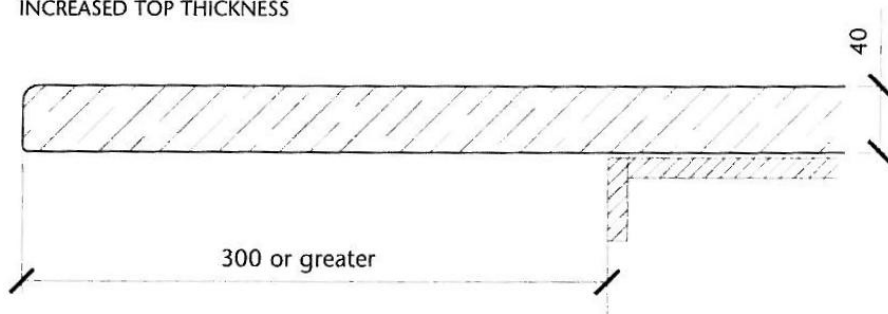
Where worktop overhangs exceed the dimensions shown above (ie. breakfast bars, counter tops, reception desks, serveries) additional substrate supporting structure must be added or thicker stone used (figure 7).

Figure 7

EXTENDED OVERHANGS REQUIRE SUBSTRUCTURE FOR
ADDITIONAL SUPPORT



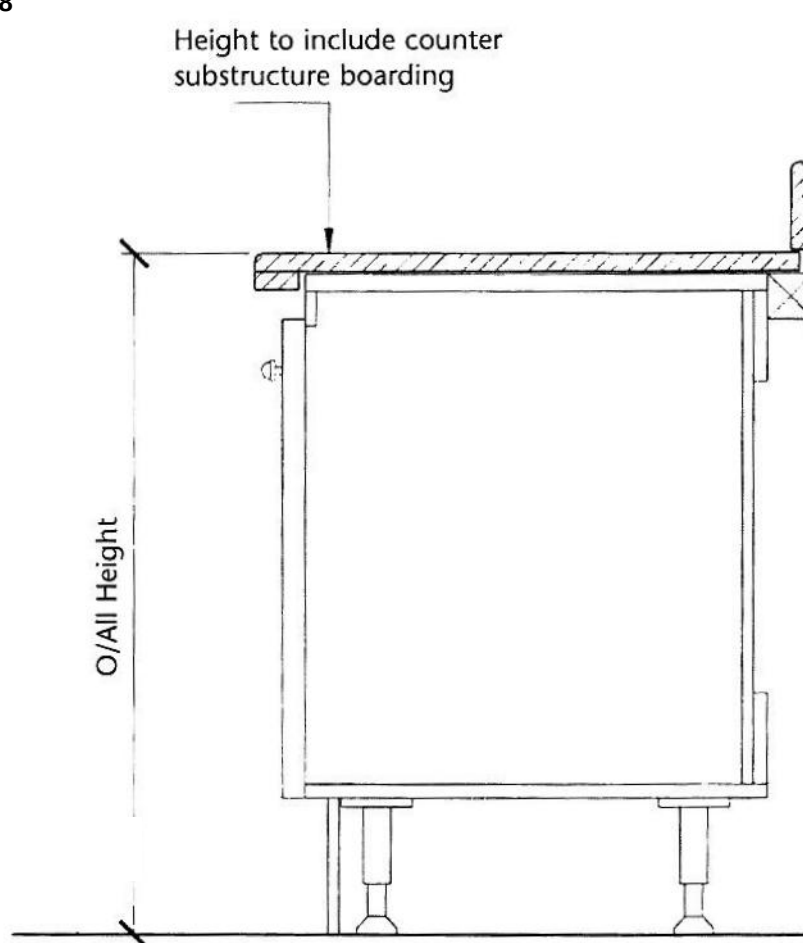
EXTENDED OVERHANGS WITHOUT SUBSTRUCTURE REQUIRE
INCREASED TOP THICKNESS



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Where a structural exterior plywood or cementitious backer board has to be installed, ensure that the additional thickness is accounted for when specifying the finished height of the cupboard or cabinet (figure 8).

Figure 8



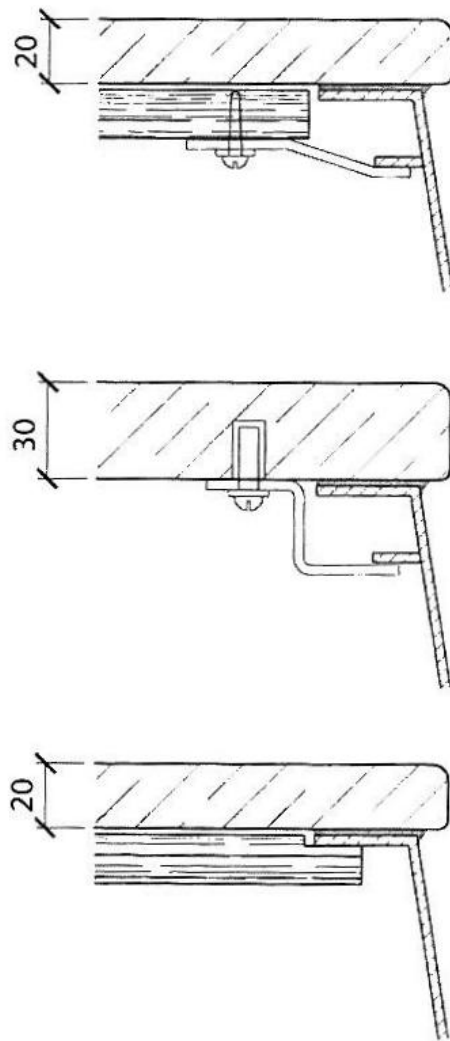
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In kitchen work tops where under mounted sinks are fixed with clips and sealant, staining can occur. Where doubt exists, the compatibility of the sealant for use with the selected stone should be checked with the supplier/manufacturer of sealant and/or stone.

Some under mounted sinks such as Belfast, butler and farmhouse require additional supporting framework constructed within the carcass.

If the under hung sink requires the use of anchor fixings, these should be installed in accordance with the manufacturer's recommendations. Stones at 20mm thickness are not suitable for use with anchors and in these instances the under hung sink must be supported from the substrate. Where anchor fixings are to be used it is necessary to ensure that the stone is at least 30mm thick and that the type selected can accept the imposed loads and the use of such anchors should be agreed between the designer and fabricator/installer. Rimmed stainless steel under hung sinks can be inset into a plywood substrate (figure 9).

Figure 9



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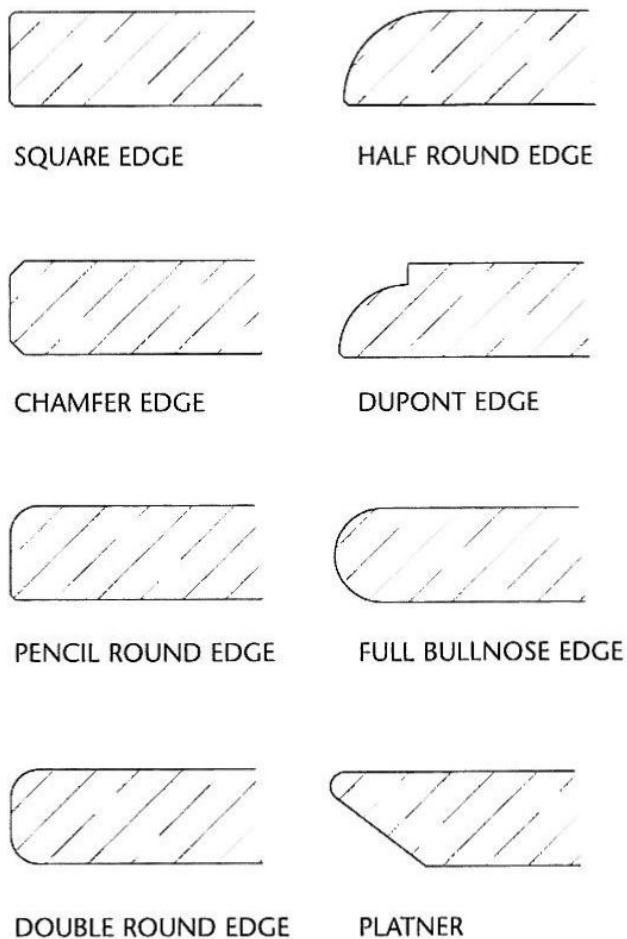
Waste disposal machines mounted into a kitchen sink require support which can be provided by a plywood substrate built into the carcass.

Sometimes due to the location of cut outs, narrow strips of stone may be required. In these circumstances the designers should satisfy themselves that this is appropriate and discuss the method of fabrication and construction with the supplier/installer.

Where large inset sinks or hobs are to be installed, the large cut outs required may require additional lateral support or framework constructed within the substrate to avoid imposed loads causing deflection and breakage of the natural stone.

The edge profiles required should be agreed with the supplier. Square edges, depending on the material, maybe more susceptible to chipping (figure 10).

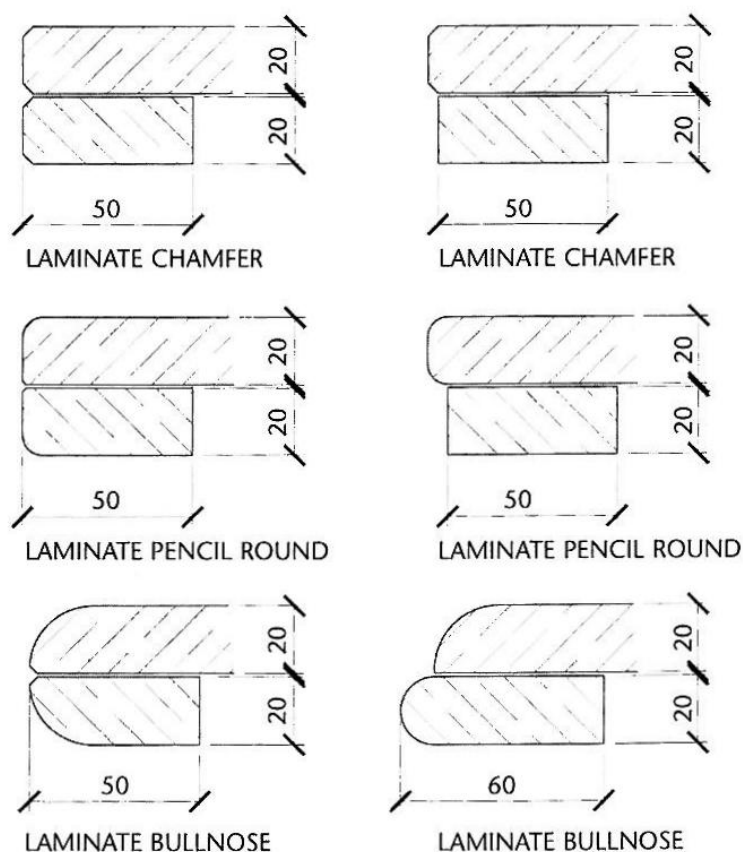
Figure 10



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Where an increased edge thickness is achieved by lamination, the additional stone will be attached at the works. This will be achieved by gluing and in some instances, dowel pinning the additional stone. Where this method of fabrication is used the designer/customer must be advised if evidence of the glue line is likely to affect the visual appearance of the edge profile (figure 11).

Figure 11

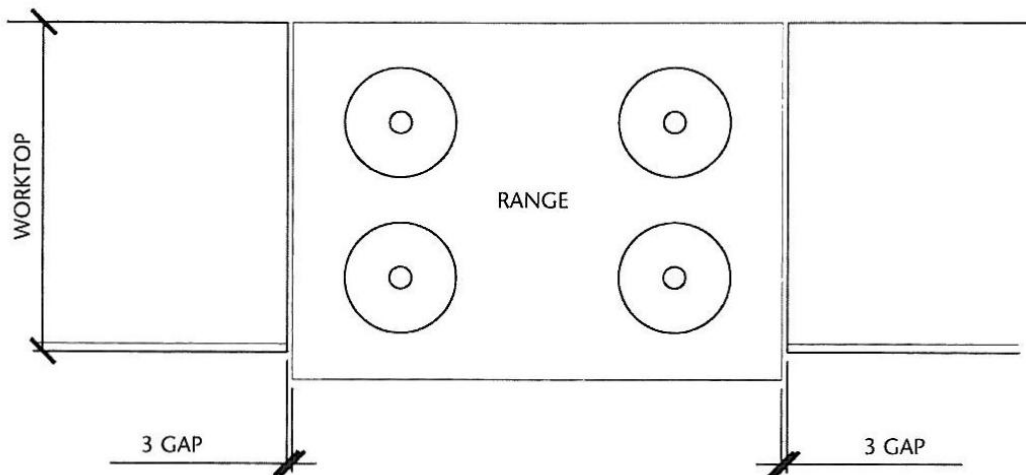


Where internal window cills are to be installed they should extend into the wall either side of the opening to ensure stability. Where this cannot be achieved the cill piece must be securely fixed. Where existing internal cills are being replaced, particularly in insulated cavity wall construction, it is essential that the correct insulation is in place and that any insulated cavity closers, if used, are retained so that the thermal integrity of the wall is not compromised.

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Where natural stone surfaces abut cooking appliances and in particular, large ranges, an air gap of at least 3mm must be left to allow for the thermal expansion and contraction of the cooking appliance (figure 12).

Figure 12



4.0 Transport and handling

The weight of most natural stone horizontal surfaces exceeds the limits set by the Manual Handling Operations Regulations 1992 and this should be recognised by the designer/installer/customer. Methods of handling and installation must be carefully considered.

5.0 Workmanship – On Site Installation

5.1 Templates

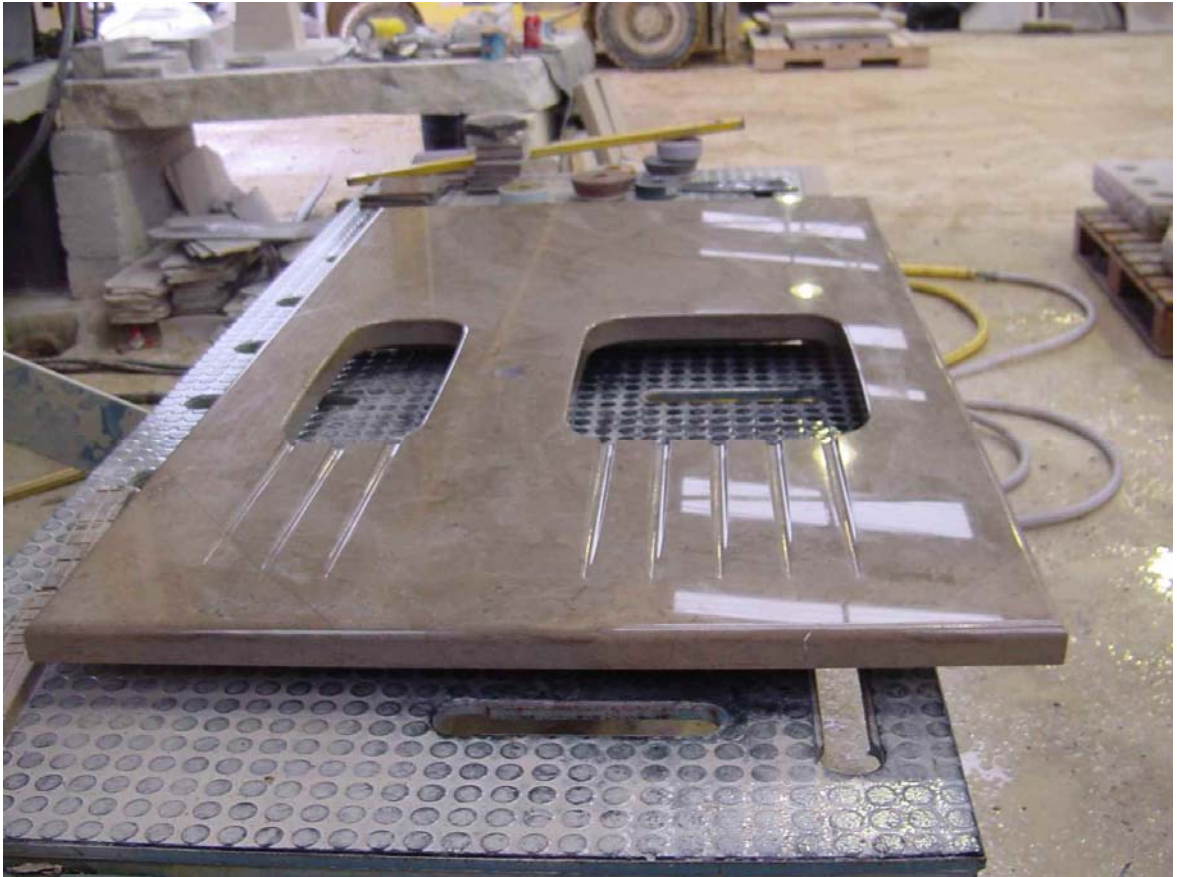
Where the horizontal surfaces are intended to fit pre-installed units it may be necessary to produce accurate templates. The production of all horizontal surfaces should only be manufactured from full templates taken on site or accurately dimensioned drawings.

Templates will generally be made from hard plastic, plywood or MDF. The template should accurately reflect any variations in the supporting structure and show the location of any cut-outs and tap holes.

By using electronic scanning, the equipment can obviate the need to make templates on site.

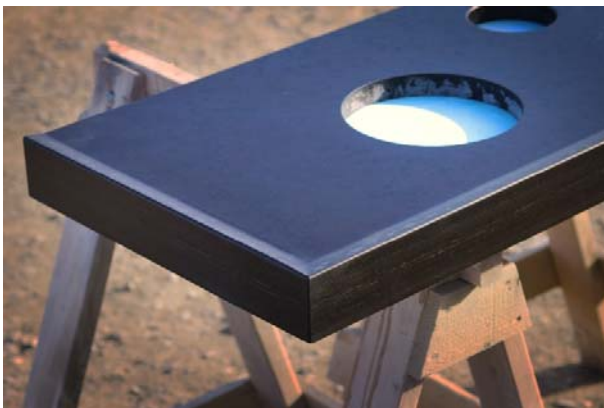
Paper, hardboard and cardboard are dimensionally unstable and are not durable and should not be used as templates for production.

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Only those persons with the appropriate skills should produce templates. Where others supply templates, the fabricator should satisfy themselves of the accuracy of the templates. Where this cannot be established, those producing the templates should take responsibility.

Where cut outs are required for sinks, basins and electric hobs etc, these should be on site so that accurate templates can be taken.



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5.2 Checking

Before work commences, all supporting carcasses and substrates must be in position for all dimensions to be checked.

Where drawings and specifications are provided the position of any cupboard and cabinet bases should be checked to ensure compliance. If the drawings do not show the position of the joints in the horizontal and vertical surfaces, their location should be agreed. Where templates are produced they should, where possible, be "signed off", checked or agreed by the designer/customer. This will ensure that all cut-outs and tap holes have been included. Where no drawings have been produced, the position and form of any joints in the horizontal and vertical surfaces should be the subject of agreement between the supplier and customer.

Where door handles and similar projections are to be allowed for, or are liable to interfere with installation, they must be in place, or details available, when templates are taken.

6.0 Tolerances

Where the wall to which the horizontal surface abuts is irregular, this should be recorded on the drawing or template. Where this occurs, sufficient allowance should be made for the worktops to be produced oversize so that they can be scribed and cut in an appropriate manner provided the material is suitable to cut on site. Granite, due to its hardness, is more difficult to cut on site and therefore adjustments are to be avoided. If a major deviation is found in the line of the wall, allowance should be made for the wall to be cut out to accept the horizontal surface.

Where up stands and splash backs are being fitted, the gap between the horizontal surfaces and backing wall should be no greater than half the thickness of the splash back. Where no splash back is being installed the gap should mirror the profile of the wall and be no greater than 6mm.

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7.0 Manufacturing Tolerances

7.1 Primary Slabs

The manufacturing tolerance of the primary slabs will vary according to its thickness. Production tolerances apply to both handmade and machine made horizontal surfaces and splash backs. If tighter tolerances are required this must be the subject of an agreement between the supplier/producer and customer.

Slab thickness	Tolerance
20mm	± 2mm
30mm – 50mm	± 3mm

7.2 Secondary Operation

The manufacturing tolerances of the secondary operation should be as follows:

- Thickness at exposed edges: Where exposed edges abut they should be gauged to ensure that no visible lips are present. Length and width: ±1.5 mm
- Squareness: The length of the diagonals should not vary by more than 1.5mm in 1m.
- Bow or twist: For all finishes the face should not vary from the plane by more than ±1.5mm in 1200mm.
- Flatness: ±1.5mm in 1200mm.
- Position of cut-outs: ±1.5mm.
- Size of cut out: ±1.5mm.
- Position and centres of drainage groove: ±1.5mm Tap holes: ±1.5mm.

7.3 Drainage Grooves

Drainage grooves should be produced so as to direct water into the bowl. There should be a minimum of 5 grooves which will vary in depth from 2mm to 5mm to provide a fall. The number, length and shape of the grooves will be dependent on the design. The finish of the grooves (polished or honed) should be agreed between the designer/customer and the fabricator/installer.

Drainage grooves should be located in the position shown on the details and within ±1.5mm of the specified position. Unless otherwise specified, drainage grooves should be positioned parallel to the front edge of the horizontal surface (figure 4).





7.4 Cut-outs

All cut-outs will be formed to match the template. Those intended for inset sinks, hobs and the like will have the edge left as cut. Cut-outs to accept under-mounted sinks must have the edge profile and surface finish polished as agreed.

Cut-outs should be positioned so as not to compromise the performance of the horizontal surface.

Where the size of the cut-out and its position results in a narrow piece of stone 60mm wide or less at the front and back of the worktop, design decisions must be taken.

The type and strength of the stone may dictate that where narrow strips or rails occur, they may be made as separate pieces. These can be fixed in place using "dowelled" and glued joints (figure 13). Alternatively the slabs can be reinforced, often referred to as rodding, by the introduction of stainless steel reinforcing rods set in rebates cut in the underside of the stone and located in place using an epoxy or polyester resin (figure 14). The resin selected must be compatible with both the natural stone and stainless steel rod.

Where inset bowls, and hobs are used and in order to guard against breakage during transit and installation, the natural stone worktop may be delivered with the cut-out only partially formed. This will then be finally cut out once the worktop is fitted, allowing the worktop to be produced without the need for separate strips or rails. This option cannot be used where underhung bowls requiring polished edges are being used.

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Figure 13

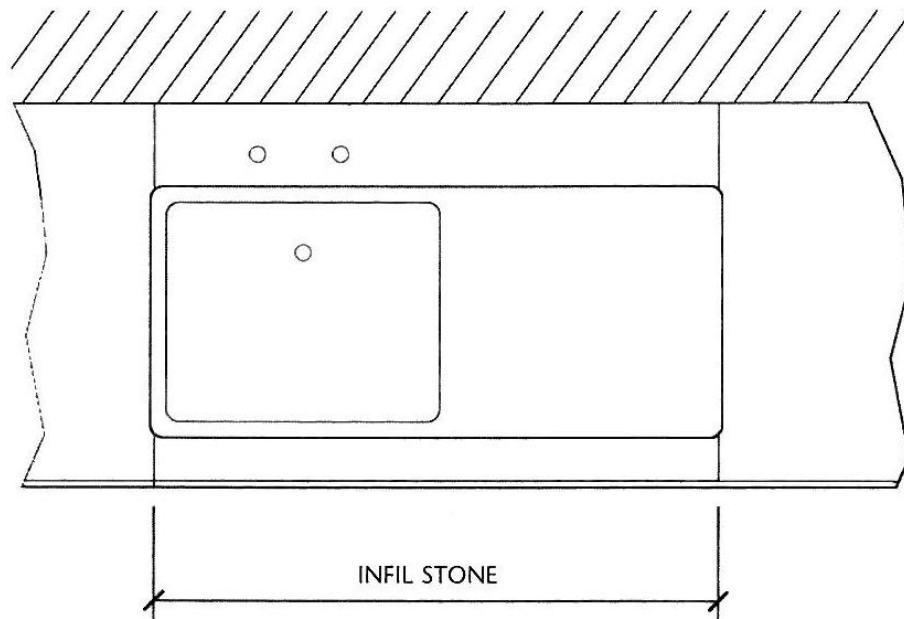
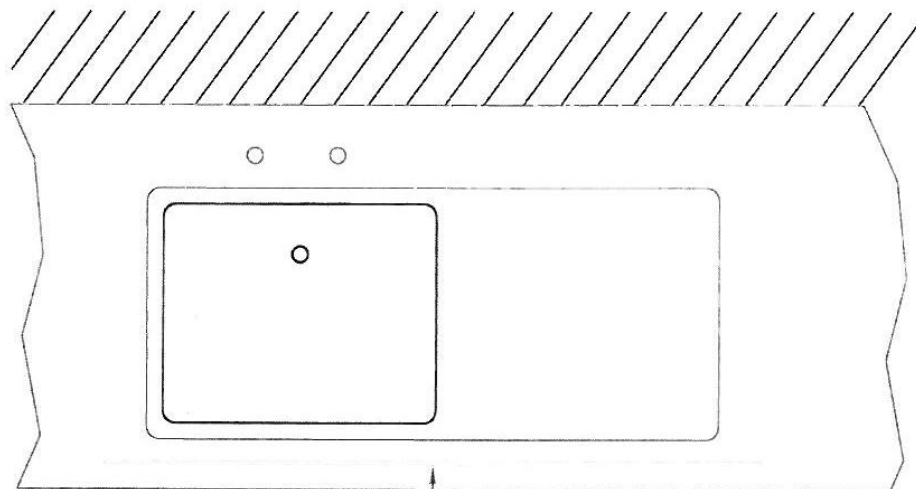
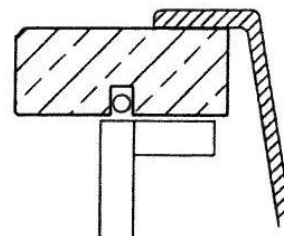


Figure 14



St/steel deformed rod set into
under side of worktop along length
of sink cut out.



4

NOSING SECTION

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7.5 Installation

Before installation commences ensure that all supporting structures are to the required level and line and are securely fixed. Where up stands, splash backs and wall linings occur, ensure that wall mounted cabinets do not interfere with installation and that all electrical outlets are in position.

Check the position of all cupboards and cabinet bases to ensure that they are in the same location as shown on the drawings and match the template details.

Carry out any site cutting of walls prior to unloading the stone.

Check level of the supporting structure and place packing shims if necessary. Only plastic or corrosion resistant material should be used.

Where required, any cutting of the natural stone or the backing wall should be undertaken prior to installation.

Where the horizontal surface is being set on WBP plywood and there is any risk of water being present, the surface of the plywood should be sealed with diluted PVA or varnish.

There are various methods for bedding the horizontal surface. This will be dependent on the use of the horizontal surface, its location, the environment in which it is being used and the installer's preference. The horizontal surface can be set on a thin bed of flexible adhesive, flexible silicon or construction adhesive. The adhesive selected should be laid as a bed 3mm - 5mm thick. If the substrate is WBP plywood the appropriate primer must be applied.

The selected bedding must achieve a secure installation and not result in any staining of the stone.

The bedding material selected must also be compatible with the supporting structure material. Where necessary, a primer must be applied to ensure that the correct bond is achieved.

Apply the selected bedding material to the substrate ensuring that sufficient quantity is applied to provide a rigid fixing.

Splash backs and wall linings must be installed using an appropriate adhesive or on a mortar bed and where appropriate, secured with stainless steel fixings.

Once installed, horizontal surfaces should be left for sufficient time for the bedding material to cure/set as stated by the bedding manufacturer. Once cured/set, the horizontal surface can be cleaned and dried.

The joints in horizontal surfaces will be filled with an appropriate resin. Resins used will be formulated to match as close as possible the colour of the stone and will generally be used where horizontal surfaces abut. Properly selected resins can be expected to have a life expectancy comparable with that of the natural stone.

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Flexible sealants are generally used where horizontal and vertical surfaces abut eg. at the junction of worktops and splash backs/up stands and wall. Correctly installed flexible sealants will have a life expectancy of 10 - 15 years providing that its performance is not compromised by mechanical impact or cleaning chemicals.

The use of inappropriate sealants and mastics can result in staining of the stone.

7.6 Installation Tolerances

Where worktops abut, the maximum joint width should be $1.5\text{mm} \pm 0.5\text{mm}$. Where worktops abut splash backs or vertical wall linings, the joint should be a maximum of 3mm.

Joints between splash backs or wall lining pieces should be $1.5\text{mm} \pm 0.5\text{mm}$.

Where the joints are to be sealant filled, these will need to be a minimum of 3mm.

All joints should be parallel unless otherwise specified. The arises of the joints at abutting stones should be free from chips, spalls and cracks.

Where horizontal surfaces abut and are exposed it is essential that the exposed edges of the stone are gauged so as to prevent any lipping.

Where an overhang occurs, the tolerance of the projection will be dependent on the accuracy of the installation of the cupboards and cabinets below and the manufacturing tolerances of the natural stone horizontal surface. Notwithstanding this, the overhang dimension should not vary from that specified by more than $\pm 1.5\text{mm}$.



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8.0 Acceptable Repair

As with all materials, there is an inherent risk during installation that slight damage may occur to the edges and the installer will be able to repair this. Therefore the use of a trained professional Stone Federation member is highly recommended.



9.0 Cleaning and Maintenance

Natural stone is a strong, long lasting and durable material but, as with any material, it does require care in use and cleaning to keep it looking at its best.

Spilt liquids including red wine, coffee, olive oil, vegetable oil etc, can stain the stone unless removed promptly. Where these are spilt, their removal using the appropriate cleaning regime is important. Guidance on this should be provided by the supplier and/or installer.

Some installers apply an impregnator prior to delivery. If this is not the case and immediately following installation, the installer should ensure that an appropriate impregnator is applied to the stone surfaces.

Where material with low absorption and porosity is being used, eg. granite, the impregnator selected must be capable of being absorbed.

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Most impregnators are not effective on wet surfaces, therefore the natural stone should be allowed to dry prior to delivery. If the stone is wet when delivered, it should be left for several days to dry before any impregnator is applied.

Where the impregnator is provided for the customer to apply, the installer must be satisfied that the customer receives suitable instructions to ensure proper application. The supplier/installer shall provide a detailed cleaning and maintenance manual.

It is then essential that the proper cleaning regime using products compatible with the stone and/or impregnator is followed so as not to compromise the efficiency.

Impregnators will require regular reapplication, the period being dependent on use and the cleaning regime adopted. The application of an impregnator could affect the aesthetics of the stone and before applying, try a small test area in an inconspicuous location.

The use of a chopping board is essential when cutting food during its preparation. This will also remove the risk of scratching the work surface with the cutting implements, especially marble and limestone. This is advised to avoid blunting knives, also some specially hardened knives can scratch the granite surface.

As with any surface which is to be used in instances where it may come into connection with heat, use a barrier or trivet mats to protect granite surfaces when placing extremely hot pans or dishes from the hob or oven on to the work surface.

Do not use any household or commercial cleaning agents containing acidic, alkaline or abrasive constituents on the granite surfaces.

There are a number of products for sealing, impregnating and cleaning on the market. However, Stone Federation is unable to give specific advice on each product because they are unable to test all the individual products on each type of stone and situation. However, the manufacturers will be able to assist clients and give advice on the use of their products on various stone types.



9.1 Maintenance of granite horizontal surfaces

The granite worktops and horizontal surfaces will have normally been impregnated with a silicone based impregnator during installation. Further careful use of the worktops is required sometimes until a further coat of impregnator is applied; this is normally 7 to 14 days after installation when the surfaces are completely clean and dry. The installer will confirm if a further application is required, which is specific to the varying density of the granite materials.

Spillages on the granite surface should be removed promptly by cleaning with warm clean water and a clean cloth, then wipe dry with a clean dry cloth to remove any surface smear marks.

Wax the surfaces once a month or on an as required basis. The granite surface should be waxed or polished using a good quality granite polish and a clean duster. Particular attention should be made to the areas adjacent to the sink and hob to avoid limescale from hard water or grease sticking to the surface of granite.



9.2 Maintenance of slate horizontal surfaces

The worktops will have been sealed with a stone seal which is a colour enhancer.

Spilt liquids should be removed promptly by cleaning with warm clean water and a clean cloth, then wipe dry with a clean dry cotton cloth to remove any surface smear marks.

9.3 Maintenance of marble horizontal surfaces

The worktops will have been impregnated with a silicone based impregnator during installation.

Spilt liquids should be removed promptly by cleaning with warm clean water or a mild detergent, then wipe dry with a clean dry cotton cloth to remove any surface smear marks.

Abrasive pads and cleaning products containing abrasives must not be used.

Regular use of marble polish/wax or a good quality furniture polish containing beeswax will help protect your marble.

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9.4 Maintenance of limestone horizontal surfaces

The worktops will have been impregnated with a silicone based impregnator during installation.

Spilt liquids should be removed promptly by cleaning with warm water or a mild detergent, then wipe dry with a clean dry cotton cloth to remove any surface smear marks.

Abrasive pads and cleaning products containing abrasives must not be used.

Remember the correct installation, maintenance regime and cleaning products will enhance the visual aspects of natural stone, giving a time served lifetime service with simple care.

Your local Stone Federation member company will be able to offer professional services and advice on all aspects of your counter tops.



Visit www.stonefed.org.uk for more information on sourcing Stone Federation members.



Stone Federation Great Britain
Channel Business Centre
Ingles Manor
Castle Hill Avenue
Folkestone
Kent CT20 2RD

T: 01303 856123
F: 01303 856117
E: enquiries@stonefed.org.uk
W: www.stonefed.org.uk



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Stone
Great Britain