



cutting, paving



CUTTING PRECAST CONCRETE
BLOCKS FLAGS AND KERBS –
EFFICIENT DESIGN AND
MANAGING THE RISK



Interpave

THE PRECAST CONCRETE PAVING
AND KERB ASSOCIATION



www.paving.org.uk

**CUTTING PRECAST CONCRETE
BLOCKS FLAGS AND KERBS –
EFFICIENT DESIGN AND
MANAGING THE RISK**



THE PRECAST CONCRETE PAVING
AND KERB ASSOCIATION

The Old Rectory, Main Street, Glenfield, Leicester LE3 8DG
tel: 0116 232 5170 fax: 0116 232 5197
e-mail: info@paving.org.uk
website: www.paving.org.uk

Interpave is a Product Association of the
British Precast Concrete Federation Ltd.
© 2010 BPCF Ltd.

Every effort has been made to ensure that the
statements made and the opinions expressed in this
publication provide a safe and accurate guide;
however, no liability or responsibility of any kind
(including liability for negligence) can be accepted in
this respect by the publishers or the authors.

INTRODUCTION AND CONTEXT

Silica is a natural component found in many construction products. Crystalline silica is found in sand, sandstone, granite and products such as concrete. Health hazards can result from breathing in the fine dust of crystalline silica. This can lead to the development of silicosis, a scarring of the lung tissue which can result in breathing difficulties. Progressive silicosis is the more common form resulting from exposure over a longer period.

The following guidelines will help you eliminate this health hazard when installing precast concrete paving blocks, flags and kerbs, either by removing the need to cut concrete products or by recommending safer cutting practices and equipment. They do not replace the employer's legal responsibilities to ensure a safe system of work.

RISK ASSESSMENT

Particular dusts, including respirable crystalline silica (RCS), carry a greater risk of ill health and have their own Workplace Exposure Limits (WELs). Since October 2006 the WEL for RCS has been 0.1 mg/m^3 . Exposures controlled to below this level carry a very low risk for developing silicosis. Above this the risk increases significantly.

On-site research has shown that cutting with a hand-held power saw which lacks dust suppression produces a level of RCS exposure many times the WEL within seconds. Not only does this have potential for the user to be exposed but also other innocent bystanders, such as work colleagues and the general public. Other research has highlighted the rapidly increasing dangers for those who smoke and are exposed to respirable silica.



In contrast, by using a power saw with water suppression the operative would require continuous exposure for some time before reaching the maximum allowable limit. However, it is important to note that, even though the exposures are drastically reduced, the operative must still wear respiratory protective equipment for full protection.

Remember that cutting kerbs, flags and paving blocks produces dust that:

- cannot always be seen
- can damage your lungs and cause health problems
- may affect workmates or members of the public standing near you.

When planning work -

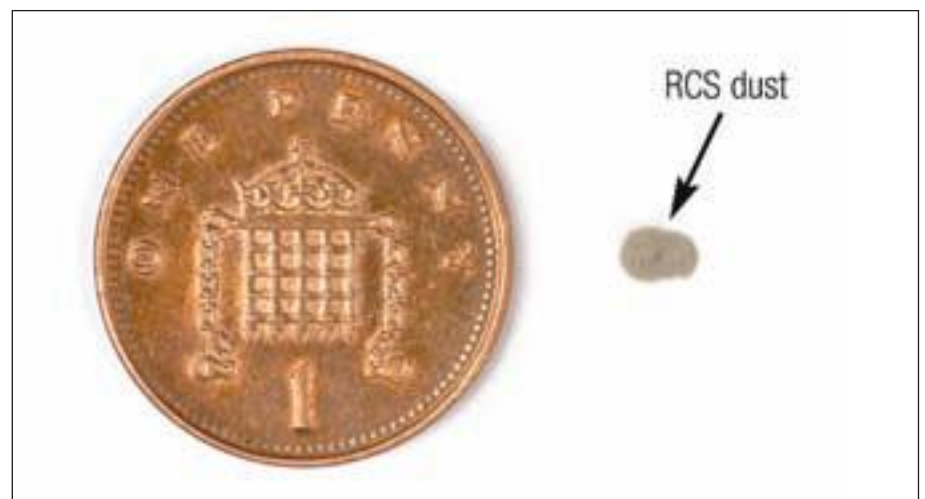
Avoid cutting

Minimise cutting

Control dust generation during cutting

Remember... **AMC** – **A**void, **M**inimise, **C**ontrol.

Finally, note that activities that could expose workers to silica are subject to the '*Control of Substances Hazardous to Health Regulations 2002*' (COSHH). These Regulations require the health risk to be assessed and then prevented or controlled. Silica must be controlled to an extremely low level (COSHH (workplace exposure) limit of $0.1\text{mg}/\text{m}^3$). You are at risk if the dust you breathe in over a full shift contains more RCS than the amount shown next to the penny!



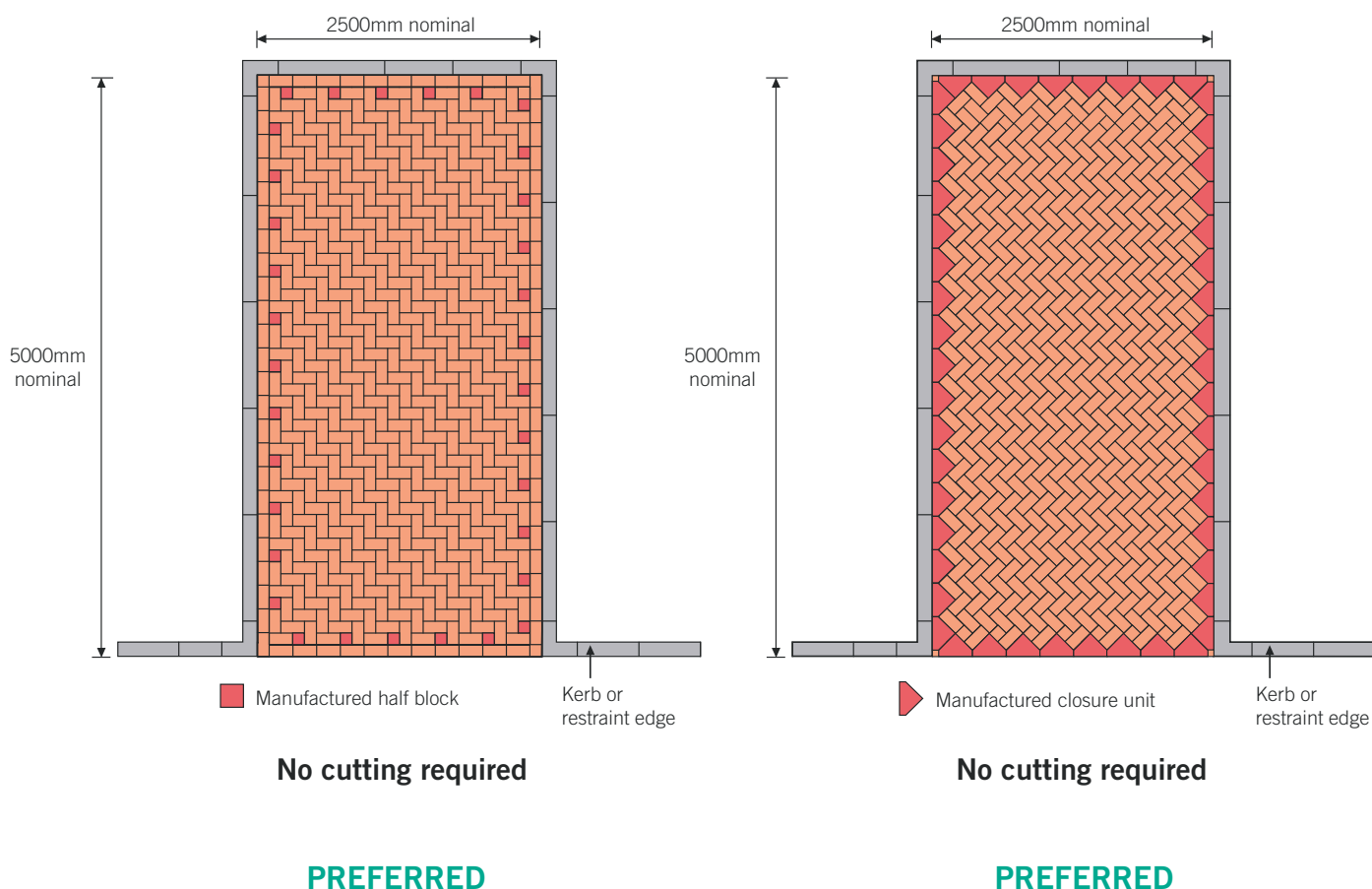
Photograph courtesy of the Health & Safety Laboratory

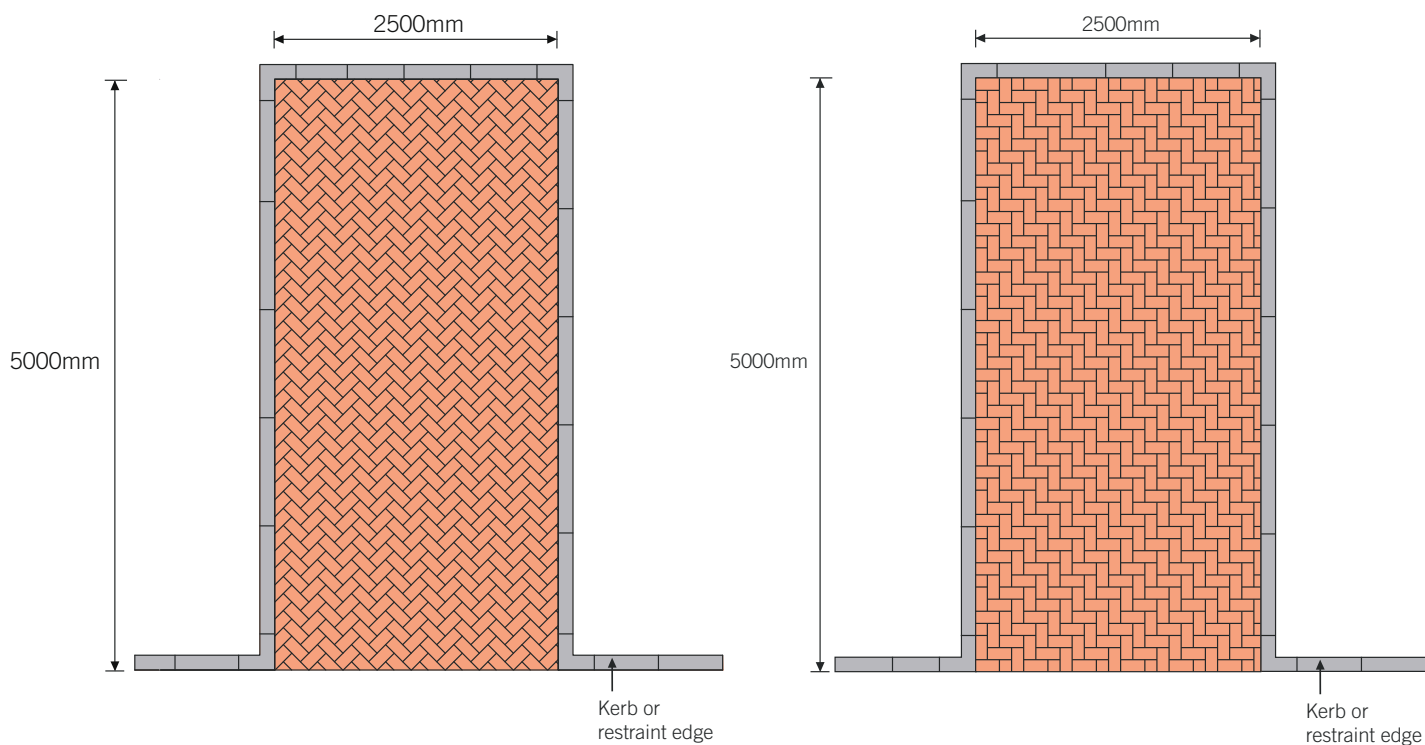
BLOCK PAVING

1 or 2. Avoid or Minimise Cutting

There are a number of techniques and products readily available to help with the design of block paved areas, created with minimal or no cutting, including the following. Information on availability of specific products and accessories is available from individual Interpave members.

Modular dimensions – design and set-out the layout for paved areas using modular dimensions (paving block width) and also apply them to penetrations or obstacles needed within the paved area.





**Cutting will be required
at all boundaries**

NOT PREFERRED

**Cutting will be required
at some boundaries**

NOT PREFERRED

Closure units – with 45° herringbone, use manufactured units (known as Bishop’s Hat or Mitre blocks) instead of cut units to complete the laying pattern.

Orientation of Laying Pattern – careful consideration of orientation during design and setting-out can eliminate the need for cutting, for example with herringbone pattern at 90° to edges rather than the popular 45°, as shown below.

Half blocks – use manufactured half blocks instead of cut units to complete the laying pattern, for example as shown above.

3. Control Dust Generation During Cutting

Selection of the right cutting equipment can minimise generation of crystalline silica dust and its availability for inhalation.

Mechanical Splitting – in many situations, block splitters can give satisfactory results and do not disperse excessive dust.



Power Saws with Dust Suppression – only bench power saws (not hand held) with dust suppression should be used for block saw-cutting.

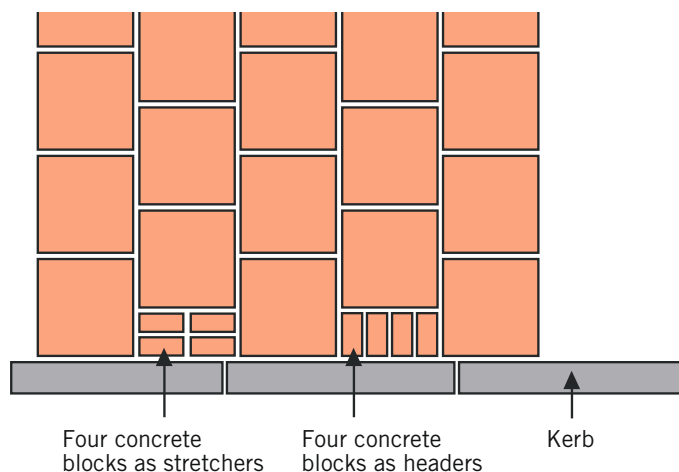


FLAG PAVING

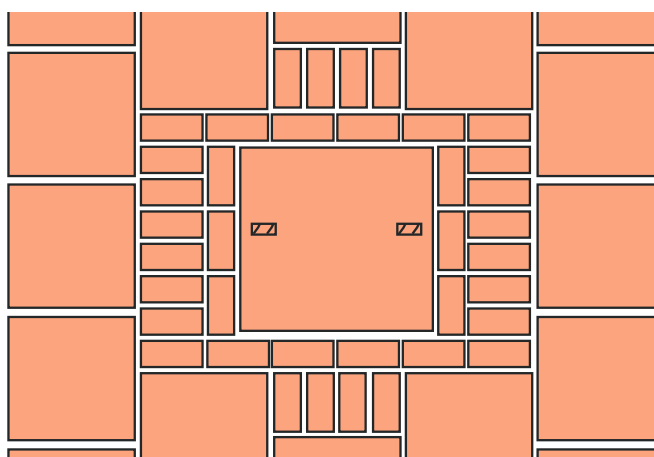
1 or 2. Avoid or Minimise Cutting

There are a number of techniques and products readily available to help with the design of flag paved areas, created with minimal or no cutting, including the following. Information on availability of specific products and accessories is available from individual Interpave members.

Modular dimensions – design and set-out the layout for paved areas using modular dimensions (multiples of standard flag sizes) and select a flag size to suit.



Block Paving in-fills – block paving can be used successfully to finish the flag laying pattern in place of cut flags, for example as shown above and below.



Consider Contour Changes – where rapid changes in contour or levels are needed, that require diagonal cuts, as an alternative select a smaller flag size or block paving, or redesign contours to accommodate bigger flags.

3. Control Dust Generation During Cutting

Selection of the right cutting equipment can minimise generation of crystalline silica dust and its availability for inhalation.

Mechanical Splitting – for small flags which can be manually handled, block splitters can give satisfactory results and do not disperse excessive dust.



Power Saws with Dust Suppression – bench power saws with dust suppression should be used for flag saw-cutting wherever possible.



For larger flags, use a hand-held power saw with dust suppression. Ensure that the flag to be cut is placed on a firm, level surface and that it can be safely held in place. Preferably, use a thick timber board or pallet to avoid damage to the blade by the surface below when cutting through the flag. Do not cut flags placed directly on the ground.



PRECAST CONCRETE KERBS

1 or 2. Avoid or Minimise Cutting

An extensive range of kerbs, channels and other components is manufactured by Interpave members including those scheduled in the British Standard BS EN 1340 and specials for a variety of applications. In particular, small unit 'kerbing blocks' (as shown below) are well-suited to forming curves, corners and transitions without cutting. Consideration of all the product alternatives and sizes available and careful setting out can reduce or eliminate the need for cutting.



3. Control Dust Generation During Cutting

Use a hand-held power saw with dust suppression. Ensure that the kerb to be cut is placed on a firm, level surface and that it can be safely held in place. Preferably, use a thick timber board or pallet to avoid damage to the blade by the surface below when cutting through the kerb. Do not cut kerbs placed directly on the ground.



GENERAL GUIDANCE

It is advisable to wash any residual slurry from the surface of the blocks, flags or kerbs to avoid staining. Ensure that slurry water or dried slurry cannot contaminate drains and that its disposal is in accordance with good site practice.

Remember that cutting kerbs, flags and paving blocks produces dust that:

- cannot always be seen
- can damage your lungs and cause health problems
- may affect workmates or members of the public standing near you.

When cutting cannot be avoided it is important to damp down or extract the dust and you must always wear breathing protection. Remember, avoid cutting if possible, minimise the cutting if you can't but always control dust generation if you do.

Remember **AMC**:

Avoid cutting

Minimise cutting

Control dust generation during cutting

As with all construction work, the appropriate personal protection equipment (PPE) should be used. Even with water suppression you will need to wear a suitable dust mask (respirator). Nuisance-grade dust masks do not protect your lungs. Use one with an assigned protection factor of at least 10, even when your water suppression equipment is working effectively. Use either FFP3 filtering face-pieces or orinasaal respirators with P3 filters. Guidance on PPE is available from HSE Leaflet INDG174 (rev1) – *A short guide to the Personal Protective Equipment at Work Regulations 1992*. Guidance is also available from Interpave on the safe handling of precast concrete flags (click here if on-line) and kerbs (click here if on-line) via www.paving.org.uk

FURTHER INFORMATION

Publications

HSE Leaflet C100 – *Time to clear the air!*, 2008

HSE Construction Information Sheet No 36 Revision 1 – *Silica*, 2004

HSE Leaflet INDG174 (rev1) – *A short guide to the Personal Protective Equipment at Work Regulations 1992*

Control of Substances Hazardous to Health Regulations. 2002

Construction (Design and Management) Regulations. 2007 (CDM).

Websites: <http://www.hse.gov.uk/index.htm>

Acknowledgements: Speedy Hire Plc

Probst Handling and Laying Systems