



**Application guide for  
Stencil Pattern  
Decorative Concrete System**

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Designer Concrete Coatings Pty Ltd

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## **1. Purpose:**

This Guide is intended to provide basic instructions for the application of Stencil Pattern decorative concrete, a surface-formed method used on freshly placed concrete to simulate brick, stone or tile paving in pathways, driveways and light-traffic roadways.

## **2. Introduction:**

Stencil pattern concrete systems originated from the United States of America and developed in Australia as an economical alternative to installation and placement of segmental brick, stone or tile pavers. The pavement on which stencil pattern concrete systems are used must be designed for the loadings and soil conditions that support it.

Reference to Standards Australia AS 3727 – 1993 Guide to residential pavements is recommended for the selection and construction of pavements associated with residential buildings consisting of single houses or multiple dwellings in medium density housing developments. It does not apply to the design and construction of public roads or streets where appropriate engineering specification is required to certify suitability and serviceability expectations of the project.

Stencil pattern concrete systems should only be selected on the basis of providing an acceptable probability of serviceability during the design life of the pavement. Slip resistance capability required by AS/NZS 4586 – 1999 and resistance to abrasion wear in accordance with test methods stipulated in AS/NZS 4456.9 – 1997 are critical considerations consistent with the serviceability expectations of stencil pattern concrete systems. Designer Concrete Coatings coloration products are NATA tested fit for intended purpose and published results significantly exceed minima requirements of the Standards. Fit for intended purpose criteria is also a compliance requirement of Fair Trading (NSW), the Home Building Act (NSW) and Trade Practices Act (Commonwealth).

## **3. Description – Stencil Pattern Concrete:**

Stencil pattern concrete systems are surface formed on freshly placed concrete. The colouring agent is cast onto the fresh concrete surface with the stencil in place and trowelled to achieve a closed-textured skid resistant surface appropriate for pavement slope in accordance with the objectives of AS/NZS 4586 – 1999. When the stencil is removed, the concrete under the stencil remains uncoloured resembling mortar joints between the cast-in-place

paving brick or tile units. A clear concrete sealer is applied to the completed works to aid concrete curing.

#### **4. Basic Application and Finishing Instructions.**

##### **4.1 Concrete Consistency.**

Concrete shall be of such consistency that it can be readily placed and compacted in the forms without segregation of materials and without excess bleed water collecting on the surface. Concrete slump shall be greater than 85mm and should not exceed 110mm unless a high range water-reducing admixture is approved. Concrete grade might normally be 20MPa or 25MPa for residential application. Higher concrete grades used in certain commercial applications may or will require mix design that slow setting times to allow stencil pattern concrete systems to be cast-in-place in a proper and workmanlike manner.

##### **4.2 Initial Concrete Finish.**

Fresh concrete shall be compacted and worked until all coarse aggregate is below the surface and mortar comes to the top. It shall then be struck off, edged and initially finished with at least a metal bull float to produce an even closed surface.

##### **4.3 Application of Stencil Pattern Matrix.**

Stencil matrix is manufactured from high strength water-resistant paper and produced in a range of traditional and contemporary paving patterns that simulate the shape of brick, stone or tiles. Stencil matrix is packaged in 50m<sup>2</sup> and 100m<sup>2</sup> rolls for placement over the paving area. Header stencil is package in 50m and 100m rolls for placement around the perimeter of the pavement. Rosette stencils in diameter dimensions of 900mm or 1.6m or 2.2m are ready made to create features within the paving area.

**Important Note:** Stencil pattern placement for consistent pattern match and decorative uniformity within the dimensions of any given pavement requires competency on the part of the installer. Stencil application by experienced concrete contractors is recommended for proper and workmanlike installation and finishing practices to affect decorative appearance and serviceability. Where experienced concrete contractors are not available, it is critical that the installer draws a paving plan, gains prepared knowledge of pattern matching stencil selections and placement detailing to plan so as to complete the work in a competent manner.

Stencil placement should commence as soon as possible but not so early where the fresh concrete surface is too wet and soft from initial bleed water rise but in sufficient time for completion of the works before concrete hard-set

occurs. Concrete surface drying is affected by prevailing weather conditions at the time of placement and therefore pre-prepared knowledge of concrete behaviour under different weather conditions is recommended for proper and workmanlike performance of the works. For example, on days of high ambient temperature and particularly when combined with high wind and low humidity the use of surface hard retardants may extend critical time to complete the works in a proper and workmanlike manner.

Where Header Course is used it must be placed first and before application of stencil to the body of the paving area. Header course is a matrix ladder of bricks, blocks or tiles. Recommended application method requires the outside 'mortar joint' strip of paper matrix to be placed atop of the formwork then cut off where it abuts the edged of the concrete – then use of a special purpose stencil roller from Designer Concrete Coatings to 'adhere' the stencil to the fresh concrete surface that precludes embedding the stencil too deep into the concrete surface. Header Course placement will require two persons. Unroll stencil from the top over the full run of each individual pavement side at a time then begin to place the Header mid span first working outwards to the ends. Mitre each right angle corner for appearance where practical to do so.

Method used to place Header stencil around curves requires making diagonal cuts in the vertical 'mortar joint' strip of the matrix at the point where it meets each of the horizontal 'mortar joint' strips within the matrix so that it will arc to the shape of the curve. Practice in method of placing Header to curves is recommended before commencement of works and/or seek practical technical advice from Designer Concrete Coatings Pty Ltd.

Application of stencil matrix to the body of the paving area will require two persons. Unroll stencil from the top over the full horizontal span of the pavement (unless otherwise specified or shown on drawings) then begin to place stencil mid span first working outwards to the ends. Trim excess stencil to pavement dimensions – then use special purpose stencil roller from Designer Concrete Coatings to 'adhere' the stencil to the fresh concrete surface. Repeat this procedure each time with care to precisely overlap and align stencil matrix to corresponding points so as to produce pattern uniformity throughout the works.

#### **4.4 Application of Colour Hardener.**

Use CCH 3000 or CMM 3000 grade colour hardener from Designer Concrete Coatings. Cast colour hardener twice – two separate casting operations evenly and uniformly over the entire fresh concrete surface. Wide areas may require the use of a bridge to ensure consistent coverage. Cast at least two thirds of the total volume of colour hardener required first; then completely and thoroughly trowel (work) into the concrete surface. Repeat this operation with the remaining one third of the total volume of colour hardener. Final finish must achieve surface texture to promote slip resistance appropriate for pavement slope in accordance with the requirements of AS/NZS 4586 – 1999.

**Colour Hardener Application Rate: 2kg to 2.5kg x m<sup>2</sup> (= 8m<sup>2</sup> – 10m<sup>2</sup> x 20kg)**

#### **4.5 Removal of Stencil Pattern Matrix.**

When the concrete achieves initial set to the point where it can support the weight of an adult person without surface damage and before hard set occurs, lift a small section of stencil to test that it will 'pull out' without unacceptable chipping or ravelling to the edges of the paving brick units. When the point of appropriate surface colour depth hardness is achieved then the stencil can be completely removed. Wear appropriate footwear so as to prevent surface damage – two pairs of thick socks is a preferred method of walking on curing concrete surfaces to remove stencil. Start from the outside of the pavement towards the centre; pulling stencil over itself until each run is completed. Avoid walking or standing where stencil has been removed as chips of colour remaining on the surface can discolour joints between the paving brick units. When stencil is completely removed, use a mechanical blower to thoroughly expel any chips of colour remaining on the surface.

#### **4.6 Application of Clear Sealing Compound.**

The intended purpose of sealer application to the completed works is to aid concrete curing that promotes durability of hardened concrete and, to aid normal maintenance requirements of pavement owners limited to surface cleanability. Best results are achieved with a two-coat application.

**Use Designer Concrete Coatings 'Prime & Seal' for the first coat.** Apply within 24 hours after completion of works to aid concrete curing.

**Use Designer Concrete Coatings 'Decorative Concrete Sealer' for the second coat.** Apply not less than three days after application of the 'prime & seal' first coat.

Best method of application: Use a lambs-wool roller for the first coat – then use a soft polypropylene bristle or natural bristle broom for the second coat. Apply sealer evenly and uniformly over the surface.

**Nominal Application Rate: 4m<sup>2</sup>/litre.**

DO NOT walk on sealed surfaces for 24 hours after application and DO NOT park motor vehicles on sealed surfaces for 72 hours after application. Read application instructions printed on sealer drums before use. Technical Notes for proper and workmanlike application are available from Designer Concrete Coatings.

#### **Important Note:**

It must be acknowledged and pavement owners made aware that the finished appearance of any clear or coloured acrylic sealing compound made for concrete surfaces may or will be affected by prevailing weather and concrete texture and porosity at the time of application and that all such sealers will deteriorate in time and by use and weathering and that if such sealer is applied no guarantee is or can be given as to finished appearance, performance or durability and neither for agents that cause surface stains and not for traction or any non-slip nature thereof and no claims in respect thereto is accepted by the installer or sealer supplier.

## **5. Precautions and Limitations of Stencil Pattern Concrete Systems.**

### **5.1 Protect Adjacent Structures:**

Colour hardener products are manufactured in powdered form and when applied may or will become airborne by prevailing weather conditions. Protect all adjacent exposed surfaces with plastic film or equivalent to prevent stain damage.

### **5.2 Pavement Grade.**

The limits nominated by Australian Standard AS 2890.1 – 1993 stipulates the maximum gradient within a residential property to be 1:5 however there is a qualification to the relevant Clause that notes that this limitation may not be practical in some particularly hilly residential locations. Under these circumstances the local regulatory authority has the discretion to relax the criterion but are advised to promulgate a clear policy as to what grades they will permit in what locations. If there is no established policy or regulatory authority approval of necessary relaxation of the 1:5 gradient limit, the pavement does not comply with the Australian Standard.

Clause 5.4 of AS 3727 – 1993 Guide to residential pavements advises that surface texture should have slip resistance appropriate for pavement slope as required by AS/NZS 4586 – 1999. Designer Concrete Coatings colouration products have capability to achieve a low risk slip coefficient of 0.68 when tested in accordance with AS/NZS 4586 – 1999.

Concrete contractors are advised to seek appropriate technical advice from local regulatory authorities where pavement grades exceed the 1:5 residential limit noted in AS 2890.1 – 1993 and written acknowledgement to pavement owners regarding precautions and limitations of slip resistance relative to pavement grade and recommended surface texture to reduce associated slip hazard risk but not prevent slipperiness induced by slope and/or environmental conditions such as rain.

### **5.3 Materials Safe Handling Advice.**

DCC Manufacturing Pty Ltd provides Materials Safety Data Advice including recommended personal protection equipment (PPE) where required for products produced and/or marketed by Designer Concrete Coatings Pty Ltd in compliance with Work Cover. This information is available with product purchases for reference to end-users.

### **5.4 Normal Maintenance requirements.**

Pavement owners are required to affect a reasonable standard of maintenance of the finished pavement to ensure an acceptable probability of serviceability and durability of the work. Principles of normal maintenance are advised in Clause 4.3 of AS 3727 – 1993 that must not preclude routine cleaning of the decorative surface including regular removal of oil spillages from motor vehicles, general sweeping of leaves etc.

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### **Product Manufacturers Disclosure.**

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