DESIGNER CONCRETE COATINGS

Application Guide for

Decorative Concrete Resurfacing

System

August 2004.

1. Purpose:

This guide is intended to provide basic instructions for the application of decorative concrete resurfacing, a spray-on method used on existing plain concrete to simulate brick, stone or tile paving in pathways, driveways and roadways and internal floors in commercial and residential buildings.

2. Introduction:

Decorative concrete resurfacing systems originated from the United States of America and developed in Australia as an economical alternative to transform existing plain concrete surfaces to simulate brick, stone or tile masonry. The concrete pavement or floor on which decorative concrete resurfacing systems are used must be structurally sound and/or should only be selected on the basis of suitable condition so as to provide an acceptable probability of serviceability of the resurfacing system during its design life. 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 of serviceability expectations of decorative concrete resurfacing systems. Designer Concrete Coatings colouration product in accordance with its mix-design specification is NATA tested fit for intended purpose and published results significantly exceed minima requirements of the above Australian/New Zealand 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 – Decorative Concrete Resurfacing:

Decorative concrete resurfacing systems are formed on existing hardened concrete pavements or floors. The cementitious-based polymer modified colouring agent is sprayed onto the hardened concrete surface with the stencil paving or floor design in place. When the stencil is removed, the surface under the stencil forms a ‘mortar joint” between the sprayed-on paving brick or tile units. A clear concrete resurfacing sealer is applied to the completed works to aid curing.

4. Basic Application and Finishing Instructions:

4.1 Assessment of Concrete Pavement/Floor Condition:

The existing hardened concrete pavement or floor shall be structurally sound without unacceptable cracking or stepping between the panels and without obvious defects such as a soft powdery surface likely to affect serviceability or design life expectations of the resurfacing system. Existing foreign matter such as tile or vinyl adhesives on floors and paint or sealer compounds on pavements must be capable of being completely removed and the surface generally must be capable of being completely and thoroughly clean of contaminants before acceptance of decorative concrete resurfacing method. Freshly placed concrete will require not less than 14 days but up to 28 days curing period before acceptance of decorative concrete resurfacing method.

4.2 Treatment of Minor Concrete Cracks:

Minor plastic shrinkage cracks and/or plastic settlement cracks must be treated so as to limit, so far as is practicable, concrete spalling and movement at the point of the crack that may or will result in chipping of the resurface coating. Flexural cracks in concrete caused by exceeding traffic design loads or by movement in the sub-base ground or by tree roots or similar undue influence must be considered untreatable. Removal and reinstatement of affected concrete is the most practical method of repair to ensure an acceptable probability of serviceability of the resurfacing works. Cracks exposed to ground-water rise may or will require special care in treatment method so as to limit, so far as is practicable, mineral deposit permeation/moisture migration to the surface that can disrupt coating adhesion and/or decorative appearance.

4.2.1 Crack Treatment Method & Surface Cleaning Procedure.

- Use a 225mm dry concrete saw blade with suitable powered grinder to chase and open the crack to at least 4mm wide x 30mm deep
- Cross cut the crack at intervals of at least every 250mm along the length of the crack – open to at least 4mm wide x 20mm deep and long enough to accept minimum 75mm x 10 gauge galvanised twist nails. This ‘cross-stitch’ process effectively dowels the concrete at the point of the crack so as to cause limited movement and widening resulting from traffic loads and ground reactivity but not prevent the reoccurrence of the crack from pavement use and/or undue influence of exposure conditions and environment.
- Prepare to clean the entire external pavement area with attention to detailing points of crack treatment using a mild hydrochloric acid solution diluted at the rate of 25:1 (5 litres water / 200ml acid). Internal

floor cleaning may or will require light grinding with rotary carborundum stone grinder with dust extraction attachment.

- Flood external concrete paving area with water. Do not apply acid solution on dry concrete surfaces. Damage will result.
- Apply diluted acid solution. Use an acid-resistant plastic watering can to apply acid solution onto the pre-wet concrete surface. Apply to a limited area each time of approximately $2m^2$ to $5m^2$. Use a stiff bristle broom to spread and agitate acid solution evenly and uniformly over the surface. Allow acid to react no more than 10 – 20 seconds on the concrete surface then completely and thoroughly rinse acid solution from the surface. Repeat this process until the entire concrete surface area is completed. DO NOT allow acid solution to dry on the surface.
- Use a high-pressure water blaster (>2000psi) to perform final surface clean.
- Mix MEGAPOXY ^{TM} (two-pack) in strict accordance with manufacturer's instructions. Pour mixed solution uniformly into saw-cut cracks and ensure that it penetrates right through the crack BUT ONLY FILL TO 3mm to 5mm BELOW THE CONCRETE SURFACE. Place galvanised twist-nail pins into 'cross stitch' saw cuts after initial treatment with MEGAPOXY ^{TM}.
- Again mix MEGAPOXY ^{TM} in sufficient quantity to fill the initially treated cracks to the surface of the concrete BUT ADD AN EQUAL VOLUME AMOUNT OF FINE DRY CLEAN – WASHED SAND to the mix. This process should stiffen the mix sufficiently for final filling the cracks AND induce aggregate grit through and atop of the cured Megapoxy so as to promote adhesion of the resurface coating.
- MEGAPOXY ^{TM} must cure at least 24 hours in summertime conditions – longer in wintertime. Refer to manufacturer's recommendations.
- Use a carborundum stone or power grinder to hand-finish treated crack areas flush with the concrete surface.

4.3 Mask Adjacent Structures:

Decorative concrete resurfacing is a spray-on method of application and mixed colour will become airborne. Protect all adjacent exposed surfaces by masking with purpose-made paper from Designer Concrete Coatings.

4.4 Prime the Concrete Surface:

The cleaned and crack treated concrete surface must be primed to limit concrete porosity so as to retain curing moisture which in turn promotes adhesion in the freshly applied resurface coating. The concrete surface must be completely and thoroughly dry before primer application.
Mix Primer – 1 Part DCC Modifier to 2 Parts Clean Water. Blend the primer mix with purpose-made paddle attachment to appropriate power drill.
Spray primer evenly and uniformly over the concrete surface.
Note: Steel trowelled smooth finish concrete surfaces will require a primer mix of 1 Part DCC Modifier to 3 Parts Clean Water.

4.5 Base Coat the Primed Concrete Surface.

Use CRS 3000 Resurfacing Colour (Part A) and DCC Modifier (Part B) from Designer Concrete Coatings.

The intended purpose of the Base Coat is to produce colour uniformity of the 'mortar joints' that are formed by the stencil matrix of the chosen paving pattern and to conceal any minor imperfections present in the concrete surface.
Where grout repair mortars are required to fill deeper surface imperfections use of Designer Concrete Coatings' CRM Concrete Grout is recommended. Refer to printed specification advice.
Apply Base Coat by trowel-on method or use a squeegee. Only use spray-on method if the cleaned and primed concrete surface is new or generally in good condition with limited visible surface imperfections that the pavement owner agrees shall not produce a deleterious affect to the decorative outcome of the completed works. Set compressor air pressure – minimum 60psi. Spray using a small-size nozzle in a circular motion holding the hopper-gun at a distance of approximately 500mm from the surface. Ensure even and uniform coverage.
Mix Base Coat – 2.5 litres Water to 2.5 litres of DCC Modifier and lightly blend then slowly add 20kg CRS 3000 Resurfacing Colour (Part A) powder. Continually blend the mix while adding the CRS 3000 Colour. Mix consistency should achieve a state of flow that can be readily trowelled or squeegeed onto the surface without segregation of materials. For spray-on method – add water and modifier to the mix limited to 100ml each time at a ratio of 1:1 (50ml Water/50ml Modifier) and blend until the mix consistency can be readily poured into the hopper-gun spray unit and applied to the surface without segregation of materials.
Important Warning: Ratio mix of Water and Modifier MUST NOT EXCEED 3 litres Water to 3 litres Modifier.

Special Precautions: Mixing processes and application procedures will require modification on days of high ambient temperatures and particularly when combined with high prevailing winds and/or low humidity and general difference in environmental conditions between summertime and wintertime. Technical advice from Designer Concrete Coatings Pty Ltd about product precautions and limitations and control of workmanship procedures in such conditions is recommended.

4.6 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^2 and 100m^2 rolls for placement over the base coated concrete surface. Header stencil is packaged in 50m and 100m rolls for placement to the perimeter of the pavement or floor area. Rosette stencils in diameter dimensions of 900mm or 1.6m or 2.2m are ready made to create features within the paving or floor area. Purpose made filament tapes manufactured in roll width of 6mm and 9mm and 12mm can be used to create custom paving designs within certain limitations.

Important Note: Stencil pattern placement for consistent pattern match and decorative uniformity within the dimensions of any given floor or pavement requires competency on the part of the installer. It is recommended that the installer draws a paving plan, has prepared knowledge of pattern matching stencil selections and placement detailing to plan so as to complete the work in a proper and workmanlike manner.

Stencil placement can commence as soon as the applied Base Coat colour has dried sufficiently to the point where it will support the weight of an adult person without disruption to the surface area.

Important Note: Detail the Base Coat by sweeping using a stiff bristle broom then use a mechanical blower to expel any residue from the surface before application of the stencil matrix.

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. Unroll stencil from the top over the full run (if practical to do so) of each side of the pavement at a time then using two persons – hold stencil at each end then place mid span first working outwards to the ends. When satisfied that the Header is positioned correctly – use removable reusable adhesive (Bostik BLU – TACK) in small quantities to secure ends and mid span and other selected points necessary to securely hold the matrix in place. 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 strips of the matrix and particularly at the point where it meets the horizontal strips within the matrix. This method provides sufficient flexibility to arc the stencil 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 floor or pavement will require two persons. Unroll stencil from the top over the full horizontal span of the floor or 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/floor dimensions – when satisfied that the stencil is positioned correctly then use BLU – TACK to secure ends and mid span and other points necessary to hold the matrix in place. 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.

4.7 Spray Surface Coat on the Fixed Stencilled Area:

Use CRS 3000 Resurfacing Colour (Part A) and DCC Modifier (Part B) from Designer Concrete Coatings.

The intended purpose of the Surface Coat is to achieve an abrasion resistant finish in accordance with AS/NZS 4456.9 – 1997 and texture to promote slip resistance appropriate for pavement slope or floor serviceability in accordance with the requirements of AS/NZS 4586 – 1999.

Apply Surface Coat by spray-on method. Two coats are recommended. Set compressor air pressure – minimum 60psi. Spray in a circular motion holding the hopper-gun at a distance of approximately 500mm from the surface.

Mix Surface Coat – 2.5 litres Water to 2.5 litres DCC Modifier and lightly blend then slowly add 20kg CRS 3000 Resurfacing Colour (Part A) powder. Continually blend the mix while adding the CRS 3000 Colour. Mix consistency should achieve a state of flow where it can be readily poured into the hopper-gun spray unit and applied to the surface without segregation of materials. Where the properly blended mix is too stiff to achieve normal hopper-gun function and even and uniform surface coverage – add water and modifier to the mix limited to 100ml each time at a ratio of 1:1 (50ml Water/50ml Modifier) and blend until mix consistency can achieve normal hopper-gun function and even and uniform surface coverage without segregation of materials.
Important Warning: Ratio mix of Water to Modifier MUST NOT EXCEED 3 litres Water to 3 litres Modifier.

Special Precautions: Mixing processes and application procedures will require modification on days of high ambient temperatures and particularly when combined with high prevailing winds and/or low humidity and general difference in environmental conditions between summertime and wintertime. Technical advice from Designer Concrete Coatings Pty Ltd about product precautions and limitations and control of workmanship procedures in such conditions is recommended.

4.8 Adding 'Hazed' Colour Tones & 'Fleck' Features:

Hazed colour tones are complementary colours used to form a decorative contrast highlight within the surface coat. Fleck features produce a peppering of colour contrast for additional decorative effect throughout the surface coat. Haze colouring of the surface requires modification of the normal mix design to the point where segregation of coarse aggregates within the CRS 3000 Resurfacing Colour (Part A) must occur so as only a fine mist or haze of colour is sprayed onto the surface coat.
Mix Haze Coat – 2.5 litres Water to 2.5 litres DCC Modifier and lightly blend then slowly add CRS 3000 Resurfacing Colour (Part A) powder only in

sufficient quantity to the point where the coarse aggregates visibly segregate and settle to the bottom of the mix and there remains only a fine aggregate liquid colour mix. Application through the hopper-gun spray unit will require higher air pressure than normally used for general surface coating. Spray Haze Coat holding hopper-gun at a distance of approximately 1m from the surface. For technical advice contact Designer Concrete Coatings Pty Ltd.

Mix Fleck Coat – use same procedure for Surface Coat (Refer Item 4.7) but only in sufficient quantity to produce a peppering of colour to the entire paving surface. Spray Fleck Coat at a distance of approximately 1m from the surface.

4.9 Removal of Stencil Pattern Matrix:

When the resurface coating 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. Start from the outside of the pavement/floor to 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 units. When stencil is completely removed, use a mechanical blower to thoroughly expel any chips of colour remaining on the surface. Use a stiff bristle broom to detail the surface and remove minor over-spray from joints before applying sealer.

4.10 Application of Clear Sealing Compound:

The intended purpose of sealer application to the completed works is to aid curing that promotes durability of the hardened resurface coating and to aid normal surface cleaning maintenance by pavement owners. Best results are achieved with a two-coat application.

Use Designer Concrete Coatings Clear Resurfacing Sealer. Apply immediately after completion of the works but only if prevailing weather conditions and surface hardness is suitable to do so. Best method of application – use a lambs-wool roller and ensure even and uniform coverage over the surface.

Nominal Application Rate: 4m^2/litre.

Apply a second seal coat not less than three days after application of the first coat. DO NOT walk on sealed surfaces for 24 hours after application and DO NOT drive or park motor vehicles on sealed surfaces for 72 hours after application.

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 resurface coatings may or will be affected by prevailing weather and surface texture and porosity at the time of application and that all such sealers will deteriorate in time and by use and weathering and where 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. Guide to Resurface Coating Finishes:

There are three proven surface finishes developed by Designer Concrete Coatings Pty Ltd – **Flood Coat** and **Texture Coat** and **Trowel Coat.**

Flood Coat – produces a flat tile finish suitable for decorative floor use and sprayed onto the surface direct from the hopper-gun using a medium sized nozzle.

Texture Coat – produces a coarse textured finish that simulates the appearance of rustic brick or stone and suitable for use on pedestrian paving or driveways and roadways. Texture Coat is achieved by applying a high-build spray coat to the surface first then afterwards a fine even second coat inclusive of a Haze Coat (if required) to enhance skid resistance and decorative appearance.

Trowel Coat – produces a flat to coarse finish that simulates the appearance of quarried stone or textured brick and suitable for use on floors and for pedestrian paving or driveways and roadways. Trowel Coat is achieved by applying the spray coat and then before initial set occurs by striking off the surface with one pass of a steel pointed trowel or wood float.

For practical and/or technical advice about best method to achieve resurface coating finishes contact Designer Concrete Coatings Pty Ltd for information or attendance at scheduled Resurfacing Training Sessions conducted by the company from time to time.

6. Basic Equipment Requirements for DCC Resurfacing Method:

- High Pressure Water Blaster – minimum pressure > 2000psi.
- Air Compressor – minimum 15 CFM fitted with moisture trap and 20m hose. Clip-on fittings for speed of operation.
- High-Torque Power Drill – geared for variable speed and of good brand quality and commercial reliability.
- GRACO™ Hopper Gun – from Designer Concrete Coatings Pty Ltd.
- Angle Grinder – minimum disk size > 200mm and of good brand quality and commercial reliability.
- 240 Volt Electric Power Extension Cord – good quality and commercial use rated and compatible with power tool manufacturers' recommendations.
- Petrol-Powered Blower.
- Metal Paddle Stirrer – purpose made for mixing CRS 3000 Colour available from Designer Concrete Coatings Pty Ltd.
- Plastic Measuring Jug – capacity > 1 litre.
- Portable Masking Paper Dispenser – purpose made from Designer Concrete Coatings Pty Ltd.

- Trowels & Squeegee – recommended by and available from Designer Concrete Coatings Pty Ltd.

7. Precautions & Limitations of Decorative Resurfacing Systems:

7.1 Protect Adjacent Structures:

Resurfacing colouration systems manufactured by Designer Concrete Coatings Pty Ltd are applied by spray-on method. Adjacent structures and any surface exposed to over spray must be appropriately masked with paper or equivalent material.

7.2 Pavement Grade:

The limits nominated by Australian Standard AS 2890.1 – 1993 stipulates the maximum gradient within a residential property to be 1:5 but qualification to the relevant Clause notes that where impractical in some particularly hilly residential locations the local regulatory authority has discretion to relax the criterion but must promulgate a clear policy of permitted grades and in what locations. If there is no established policy or approval of necessary relaxation of the 1:5 gradient limits, then the pavement does not comply with the Australian Standard.

Clause 5.4 of AS 3727 – 1993 Guide to residential pavements advises that the surface texture should have slip resistance appropriate for pavement slope as required by AS/NZS 4586 – 1999. CRS 3000 Resurfacing Colour products manufactured by Designer Concrete Coatings Pty Ltd have capability to achieve a low risk slip coefficient of 0.80 when tested in accordance with the Standard.

Decorative concrete resurfacing 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.

7.3 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.

7.4 Normal Maintenance Requirements:

Pavement owners are required to affect a reasonable standard of maintenance of the finished work to ensure an acceptable probability of serviceability and durability. Principles of normal maintenance with respect to residential pavements 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 and general sweeping of leaves etc to preserve decorative appearance.

Product Manufacturers Disclosure:

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Licensed or otherwise appropriately experienced decorative concrete resurfacing contractors who use and/or recommend Designer Concrete Coatings' product systems are independent entities and bears responsibility for workmanship and proper application of Designer Concrete Coatings' product systems and asserts that the contractor is fully conversant in the proper application of decorative concrete resurfacing method and has received copies of the manufacturer's product systems specification.

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